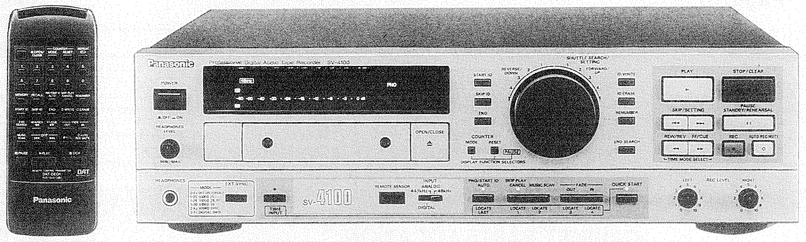
ORDER NO. AD9409253C2

Service Manual

DAT

Professional Digital Audio Tape Recorder

SV-4100



Colour

(H) ... Gray Type

Area

Suffix for Model No.	Area	Colour
(EB)	Great Britain.	(H)
(EG)	Germany and Italy.	

RA1001 MECHANISM SERIES

SPECIFICATIONS

■ Signal Format

Tape recording system:	Rotary head type DAT
Sampling frequency:	
Analog input recording	48kHz, 44.1kHz
Playback/Digital input recording	48kHz, 44.1kHz, 32kHz (selected automatically)
No. of quantizing bits:	16-bit linear
No. of channels:	2 (stereo)

■ Audio Parameters (Analog recording and Playback System)

Frequency response:	
fs: 48kHz	10Hz−22000kHz (±0.5dB)
fs: 44.1kHz	10Hz−20000kHz (±0.5dB)
Total harmonic distortion:	Less than 0.05% (−18dB, 1kHz)* Less than 0.007% (0dB, 1kHz)*
Dynamic range:	Greater than 92dB*
SN ratio:	Greater than 92dB*

*DIN audio weighted (22.4Hz to 22.4kHz bandpass filter)

Wow and flutter:	Unmeasurable

■ Remote Control

Parallel remote:	8 pin DIN connector (60 functions available)
GPI remote:	Stereo 6mm jack (Play & Pause functions)

■ Input/Output jacks

Analog input:	
Input jacks	XLR-3 type
Nominal input level (−18dB rec level)	+4dBu
Input impedance	10kΩ balanced
Analog output:	
Output jacks	XLR-3 type
Nominal output level (−18dB)	+4/−10dBu
Output impedance	75Ω balanced
Headphones output:	
Maximum level	30mW+30mW (32Ω)
Matching impedance	8−600Ω
Digital (AES/EBU type):	
Input	XLR-3 type/110Ω balanced
Output	XLR-3 type/110Ω balanced
Digital (IEC type Ⅱ):	
Input	RCA phono type (Coaxial)/75Ω, Optical
Output	RCA phono type (Coaxial)/75Ω, Optical
Video Sync Input:	
Input jack	BNC type
Input signal	NTSC: 29.97 FPS, 30 FPS PAL/SECAM: 25 FPS
Nominal input level	1Vp-p/75Ω
Word Sync Input:	
Input jack	BNC type
Input level	TTL Level compatible/75Ω
Word Sync Output:	
Output jack	BNC type
Output level	TTL Level compatible/75Ω

■ Mechanism

Cylinder diameter:	30mm
Cylinder rotation speed:	200r.p.m.
Tape speed:	
(Normal track)	8.150mm/Sec.
(Wide track)	12.225mm/Sec.
Search speed:	Up to 250 times normal playback speed
FF/Rewind speed:	Up to 250 times normal playback speed
FF/Rewind time:	Approx. 35sec. (2 hours DAT tape)

■ General

Power consumption:	35W
Power supply:	AC 50Hz/60Hz, 230−240V
External Dimensions (W×H×D):	430×122×315mm
Weight:	6.4kg

Note:
Design and specifications are subject to change without notice.
Weight and dimensions are approximate.

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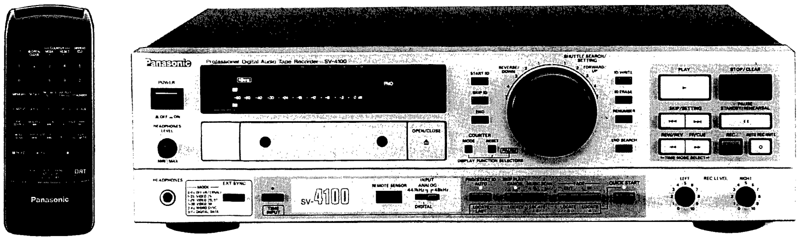

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Output impedance	75Ω balanced
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Maximum level	30mW+30mW (32Ω)
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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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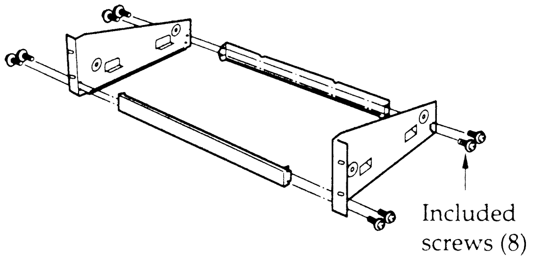
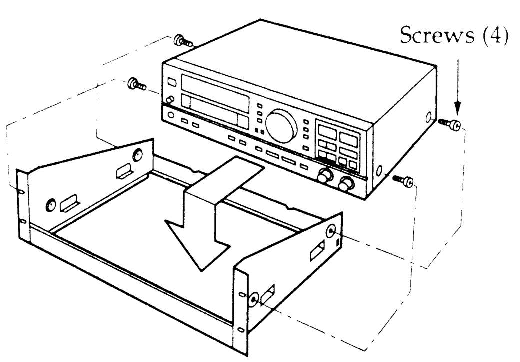
■ INSTALLATION

Installation of rack mount kit

1 Assemble the rack ears and panels, and tighten with included screws.



2 Remove the 4 screws on side enclosure, and attach the unit to the rack mount.



Notes on placement

- ■ Place on a flat, level surface so that the front-rear inclination does not exceed 15°.
- ■ Avoid places such as the following:
  - Near any equipment or device that generates strong magnetism.
  - On any heat-generating equipment or device, or in any place where the temperature is high (40°C or higher).
  - Extremely cold places (5°C or below).
  - Near an AM/FM tuner or TV.
    (It may produce noise in the broadcast, or disturb the TV picture.)
  - For long periods of time in direct sunlight.
  - In dusty or smoky locations.
  - In locations prone to vibrations.
  - In locations where the rear panel is less than 10 cm away from the wall or back of an audio rack.
  - Within reach of children.
- ■ Do not place heavy objects, other than system components, on top of the unit.
- ■ When carrying or storing the unit, handle it with care so it is not subjected to any strong bumps.
- ■ To avoid problems due to vibration.
  - Do not place a book or similar object under this unit.
  - Do not route the connection cables (of this or other units) across the operation panel, across the top, or under the unit.

■ ACCESSORIES

AC power supply cord [For (EB) area, (RJA0045-K)]	1 pc.
AC power supply cord [For (EG) area, (RJA0003-K)]	1 pc.
Coaxial cable (SJPD19-1E)	1 pc.
Remote control transmitter (RAK-SV012WH)	1 pc.
Batteries (AAA, R03, UM-4)	2 pcs.
Note: There are available on sale route.	
Rack mount kit	
(The rack ears: [For (EB) area, (RYQ0059-1)])	1 pc.
(The rack ears: [For (EG) area, (RYQ0059-2)])	1 pc.
(The rack panels: RYQ0060-1)	1 pc.
Screws (XYN3+F10FZ)	8 pcs.

■ CAUTION FOR AC MAINS LEAD

(For [EB] area)

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire which is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug which is marked with the letter E or by the Earth symbol ⏚ or coloured GREEN or GREEN-AND-YELLOW.
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

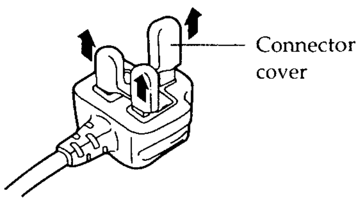
IMPORTANT A 5 amp fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amps and that it is approved by ASTA or BSI to BS1362. Check for the ASTA mark or BSI mark on the body of the fuse. IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY. THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13 AMP SOCKET.
If a new plug is to be fitted please observe the wiring code as shown below. If in any doubt please consult a qualified electrician.

IMPORTANT The wires in this mains lead are coloured in accordance with the following code:
Green-and-Yellow: Earth
Blue: Neutral Brown: Live

WARNING THIS APPLIANCE MUST BE EARTHED.

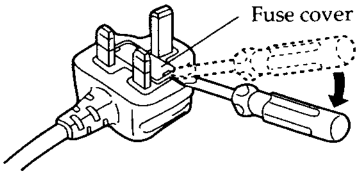
Before use

Remove the connector cover as follows.

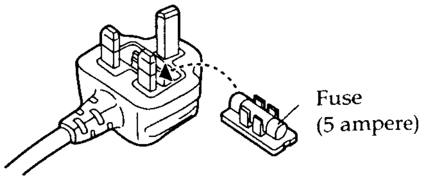


How to replace the fuse

1 Remove the fuse cover with a screwdriver.



2 Replace the fuse and attach the fuse cover.



■ CONNECTIONS

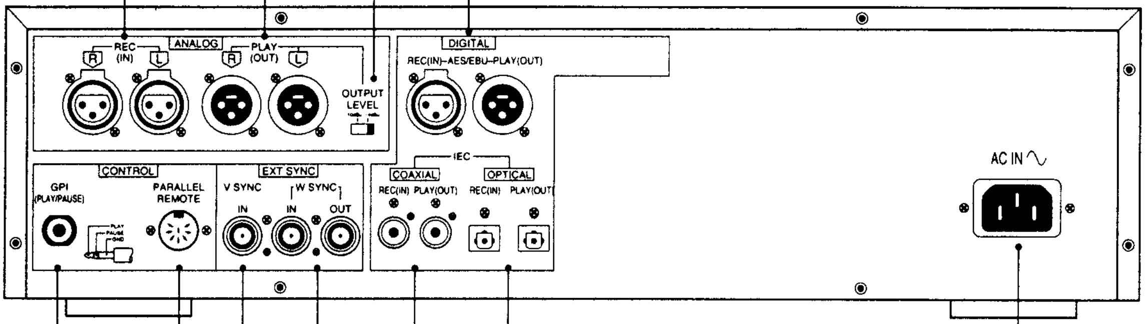
Rear Panel

ANALOG IN terminals
These are balanced analog audio XLR input connectors.

ANALOG OUT terminals
These are balanced analog audio XLR output connectors.

OUTPUT LEVEL selector (+4 dBu/–10 dBu)
Select the nominal output level (nominal level for a peak level meter display of –18 dB).

AES/EBU terminals (IN/OUT)
These terminals are for input or output of signals for the professional digital interface.


REC (IN)
ANALOG
PLAY (OUT)
R
L
OUTPUT LEVEL
DIGITAL
REC(IN)–AES/EBU–PLAY(OUT)
IEC
COAXIAL
REC(IN) PLAY(OUT)
OPTICAL
REC(IN) PLAY(OUT)
AC IN ∿
CONTROL
GPI (PLAY/PAUSE)
PARALLEL REMOTE
EXT SYNC
V SYNC
W SYNC
IN
IN
OUT

AC IN jack
Connect to the grounded AC outlet with the included AC power supply cord.

IEC (IEC 958 for consumer use) optical terminals (IN/OUT)
These terminals are for input or output of digital signals from/to a consumer unit by using the optical cable.

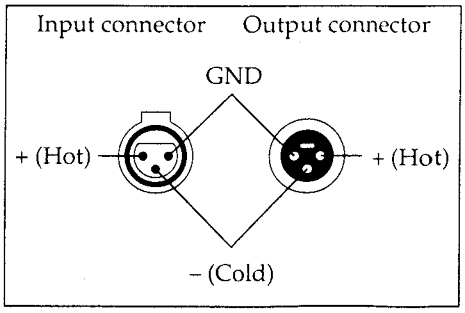
IEC (IEC 958 for consumer use) coaxial jacks (IN/OUT)
These terminals are for input or output of digital signals from/to a consumer unit by using the coaxial cable.

WORD SYNC terminal for external synchronization

VIDEO SYNC terminal for external synchronization

REMOTE CONTROL jack (PARALLEL)
See page 5.

GPI input terminal (PLAY/PAUSE)
See page 6.


Input connector
Output connector
GND
+ (Hot)
+ (Hot)
- (Cold)

When making digital IN/OUT connections

If the connections to studio equipment are set incorrectly, a loop may be set up where the output of the unit is connected to its recording input. This will not only set up an oscillation but may also damage the monitor speakers. Attention should therefore be paid to the following points:

1) When recording or playing back through the unit's DIGITAL IN/OUT terminals, be sure to connect these terminals to the DIGITAL PLAYBACK (IN)/DIGITAL REC OUT (OUT) terminals of other equipment.

2) If the monitor amplifier has no DIGITAL PLAYBACK or DIGITAL REC OUT terminals, this unit (DAT) can be used only for playback through the ordinary DIGITAL INPUT terminals on the amplifier.

3) If connections are made as in 2) and it is desired to record, do not on any account set the INPUT SELECTOR of the amplifier to "DIGITAL".

■ CONCERNING THE REMOTE CONTROL

This unit has three systems for remote control operation, using the infra-red remote sensor, the 8-pin parallel input terminals or GPI input terminal.

Remote Control Transmitter

Battery installation

Insert the batteries with using two AAA, R03, UM-4 (1.5 V) or equivalent batteries in the correct polarities (+, −).

To remove the batteries, push down the – side.

Notes:
- Do not mix old and new batteries, or batteries of different types (manganese and alkaline, etc.).
- Never subject batteries to excessive heat or flame; do not attempt to disassemble them; and be sure they are not short-circuited.
- If the remote control is not to be used for a long period of time, remove the batteries and store them in a cool, dark place.
- Do not attempt to recharge alkaline or manganese batteries.

Battery life:

The battery life is about one year. The batteries should be replaced if commands from the remote control transmitter do not operate the unit even when the transmitter is held close to the front panel.

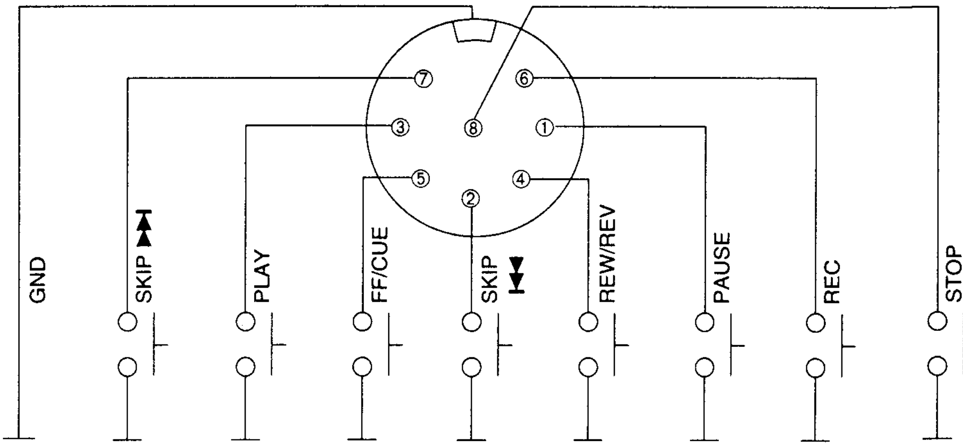
Correct method of use

1 Aim the remote control's transmission window toward the unit's sensor. Avoid any obstacles.
2 Use the remote control within a 60-degree angle of the unit.
The maximum distance is within 7 meters directly facing toward the unit.

Notes:
- Be sure the transmission window and the unit's sensor are free from dust. Excessive dust might affect its performance.
- The operation may not be correct if direct sunlight or other strong light source strikes the receiving sensor of this unit. If there is a problem, place the unit away from the light source.
- If this unit is installed in a rack with glass doors, the glass doors' thickness or color might make it necessary to use the remote control a shorter distance from the unit.

8-Pin Parallel Input Terminals

By connecting the following circuits, the SV-4100 can be operated by remote control using normal switches.



8-Pin Remote Specifications

8-pin remote key code:

Note: The time taken until the key code for operating multiple commands must be less than 1 ms, and each code input must be more than 60 ms.

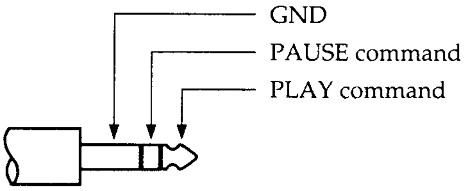
Function	8-pin DIN jack key	Function	8-pin DIN jack key
	Code No. 87654321		Code No. 87654321
open	00000001	6 (key pad)	10001001
music scan	00011000	7 (key pad)	10101000
skip cancel	00110000	8 (key pad)	10101001
stop	01111111	9 (key pad)	11000000
play	11111011		
write	01101001	memory	01000000
		recall	01000001
auto rec mute	00100000	repeat	01100001
rec	11011111		
pause	11111110	write_start–ID	01010000
forward skip	10111111	write_skip–ID	01010001
reverse skip	11111101	erase_start–ID	01110000
		erase_skip–ID	01110001
counter mode	00101000		
auto PNO	00110001	rec+play	11011011
fade in	00100001	direct rec_pause	00011001
fade out	00001000	direct rec_play	00111000
ff	11101111	unload	00111001
rew	11110111	mode+reset+pause	10110000
renumber	00010001		
		locate last	10000010
counter reset	00001001	locate 1	10000011
end–ID	01101000	locate 2	10100010
skip–ID	01001001	locate 3	10100011
start–ID	01001000	locate 4	10001010
end search	01100000	time input	10010000
erase	00010000	external SYNC	10010001
		quick start	10110001
0 (key pad)	11000001		
1 (key pad)	10000000	skip cancel on	00000010
2 (key pad)	10000001	skip cancel off	00000011
3 (key pad)	10100000	auto PNO on	00100010
4 (key pad)	10100001	auto PNO off	00100011
5 (key pad)	10001000	quick start on	00001010
		quick start off	00001011

0: The connection is shorted.
1: The connection is open.

GPI Input Terminal

This unit is equipped with a frequently used "PLAY" function and "PAUSE (REHEARSAL)" function in the form of GPI (General Purpose Interface) input terminal provided in addition to the 8-pin parallel input jack.

GPI input:
The "PLAY" and "PAUSE (REHEARSAL)" commands are read from the GPI terminals (stereo 6 mm jack on the rear panel).



These commands are set by changing their logic status from open circuit to GND shorting.

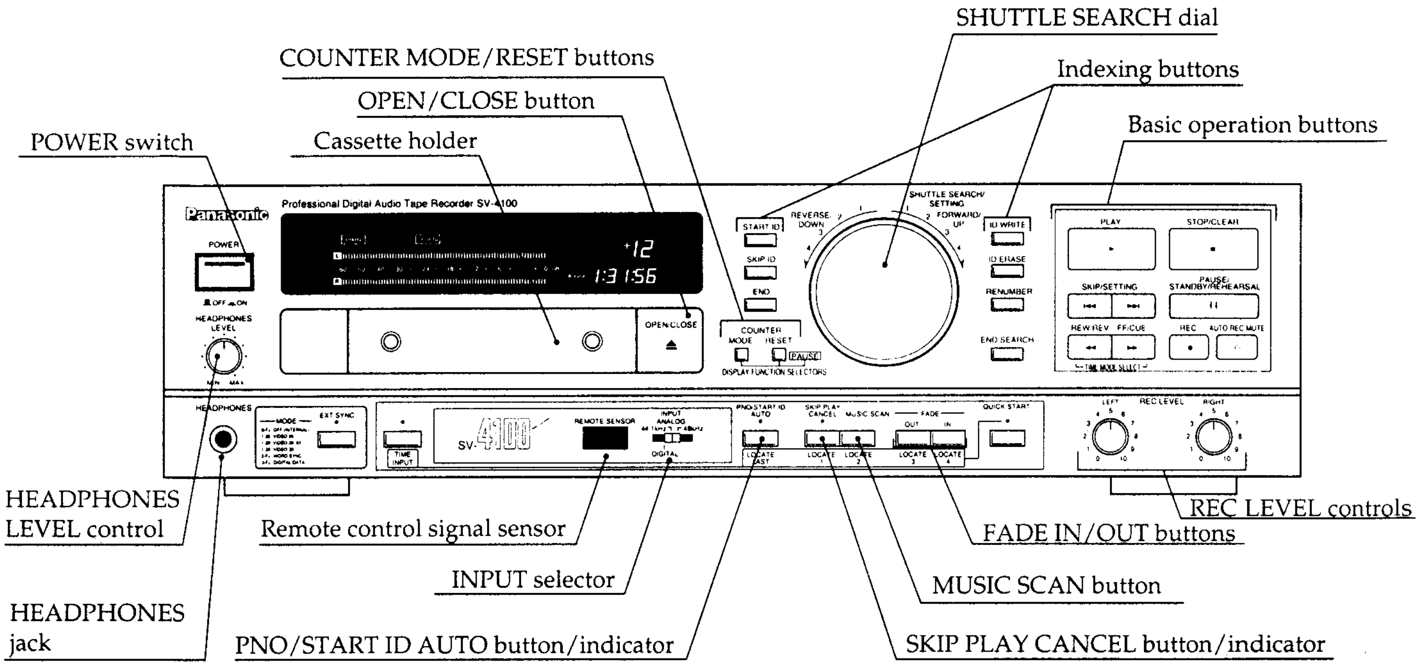
CAUTION! If you decide to make a remote control (8-pin remote or GPI) for the unit yourself, be sure it is properly shielded in order to prevent the radiation of unwanted noise from the unit and the connection cables.

■ LOCATION OF CONTROLS

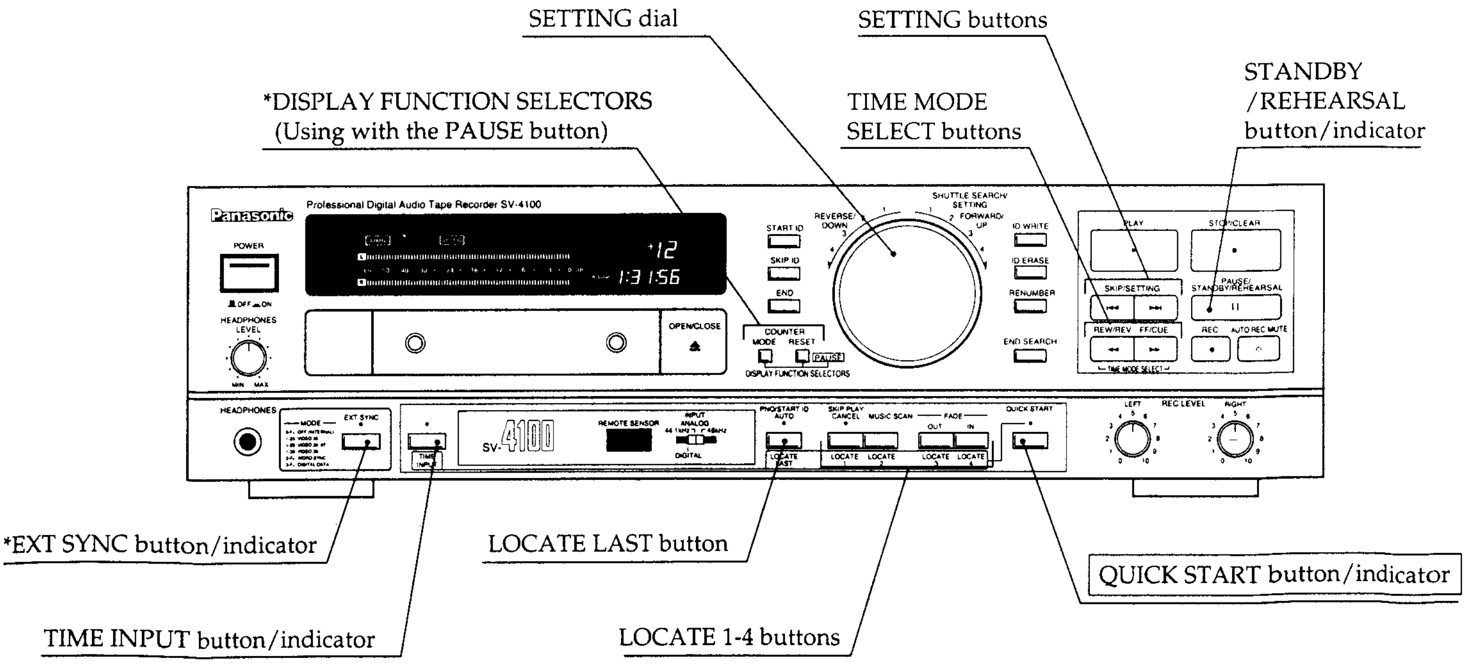
Front Panel

This unit comes with two modes, the regular operating mode and quick play mode, and the modes can be selected by setting the QUICK START button to ON or OFF.

(1) Controls mainly used in the regular operating mode

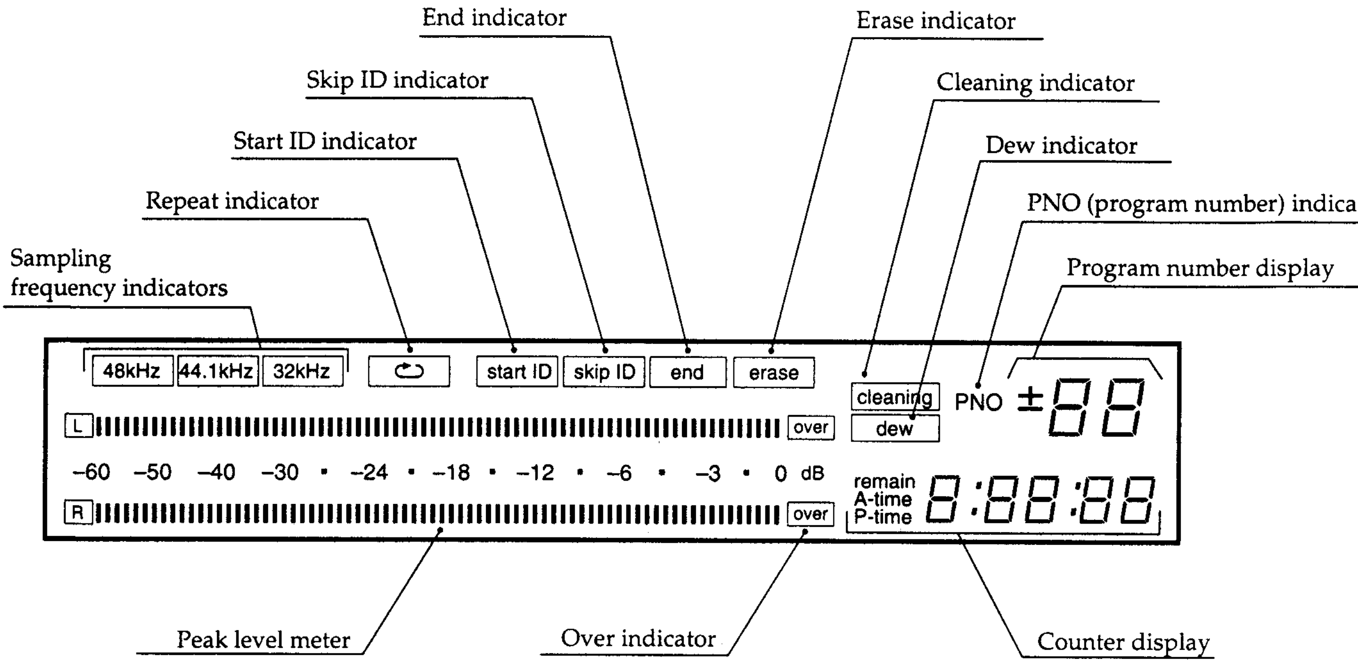

SHUTTLE SEARCH dial
COUNTER MODE/RESET buttons
Indexing buttons
OPEN/CLOSE button
Basic operation buttons
POWER switch
Cassette holder
HEADPHONES LEVEL control
Remote control signal sensor
REC LEVEL controls
FADE IN/OUT buttons
INPUT selector
MUSIC SCAN button
HEADPHONES jack
PNO/START ID AUTO button/indicator
SKIP PLAY CANCEL button/indicator

(2) Controls mainly used in the quick start mode

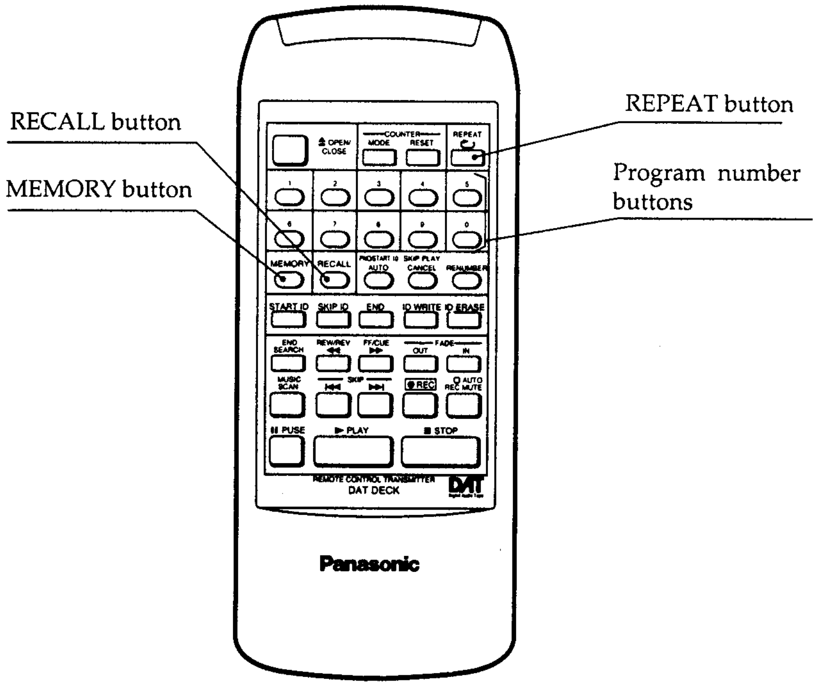

SETTING dial
SETTING buttons
STANDBY /REHEARSAL button/indicator
*DISPLAY FUNCTION SELECTORS (Using with the PAUSE button)
TIME MODE SELECT buttons
*EXT SYNC button/indicator
LOCATE LAST button
QUICK START button/indicator
TIME INPUT button/indicator
LOCATE 1-4 buttons

*These controls can also be used in the regular operating mode.

Display Panel


End indicator
Erase indicator
Skip ID indicator
Cleaning indicator
Start ID indicator
Dew indicator
Repeat indicator
PNO (program number) indica
Sampling frequency indicators
Program number display
48kHz
44.1kHz
32kHz
start ID
skip ID
end
erase
cleaning
dew
PNO
L
over
-60 -50 -40 -30 • -24 • -18 • -12 • -6 • -3 • 0 dB
remain
A-time
P-time
R
over
Peak level meter
Over indicator
Counter display

Remote Control Transmitter


RECALL button
MEMORY button
REPEAT button
Program number buttons
OPEN/CLOSE
COUNTER
MODE
RESET
REPEAT
MEMORY
RECALL
START ID
SKIP ID
END
ID WRITE
ID ERASE
END SEARCH
REW/REV
FF/CUE
FADE
OUT
IN
MUSIC SCAN
SKIP
REC
AUTO REC MUTE
PAUSE
PLAY
STOP
REMOTE CONTROL TRANSMITTER
DAT DECK
DAT
Panasonic

Unexplained buttons on the remote control transmitter function identically to their corresponding parts on the SV-4100.

■ SV-4100 DAT MAINTENANCE CHART

• REGULAR MAINTENANCE

The purpose of periodic maintenance as recommended is to keep the equipment in the best possible operating condition throughout its useful life. Observance of this maintenance schedule ensures that maximum performance and reliability is obtained from the machine.

Regular maintenance is necessary because the DAT Recorder is a high-technology piece of equipment, containing DC motors, head cylinder assemblies, and a complex mechanism. These components deteriorate over time. Dust and dirt can clog the head gap, which affects the sound. In light of this, it is very important that overall maintenance be performed according to the maintenance chart to avoid problems resulting from heavy image. Maintenance should also be performed after any repairs on the equipment.

Maintenance is particularly recommended for DAT Recorders used in commercial and broadcast applications for serveral reasons. Installation and application are frequently under less than ideal conditions, such as long usage times and poor environmental conditions. All of this adversely affects the life span and performance of the machine. Regular maintenance assures that the purchaser obtains maximum value for this expenditure.

Note: Refer to the hour meter to know when to perform the maintenance.

Part Name	Part Number	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
Upper Cylinder	VEH0460	○	●	○	●	○	●	○	●	○	●
Cylinder Unit	VEG0752	○	○	○	○	○	○	○	○	○	●
S. Load Arm Ass'y	RXL0052										●
T. Load Arm Ass'y	RXL0054										●
Load Cam	RDK0006-1						●				
Capstan Unit	REM0001	○	○	○	○	○	○	○	○	○	●
Post Roller	RXP0008	○	○	○	○	○	○	○	○	○	●
Guide Roller	RXP0027	○	○	○	○	○	○	○	○	○	●
Pinch Roller	1NB0001ZA	○	○	○	○	○	●	○	○	○	○
S. Reel Ass'y	RXR0006										●
T. Reel Ass'y	RXR0007										●
BT Lever	RXL0048										●
Tension Band Ass'y	RXL0036						●				
S. Brake Ass'y	RXL0049						●				
T. Brake Ass'y	RXL0050						●				
Idler Gear	RDG0071										●
Mode Motor Ass'y	REM0009								●		
Mode Cam	RDK0007-1										●
M Gear B	RDG0067										●
Drive Gear Ass'y	RXG0011						●				
Idler Gear (F)	RDG0069										●
Idler Gear (P)	RDG0068										●
Mode SW Ass'y	RES0002						●				
Load SW Ass'y	RES0001										●
Cassette SW	EVQWR4002										●
Earth Terminal	RUS740ZA										●
Loading Motor	MMN-6FBRC8S										●
Belt	SMQ20025										●
Leaf SW	SSPD18										●

● Replacement, ○ Cleaning

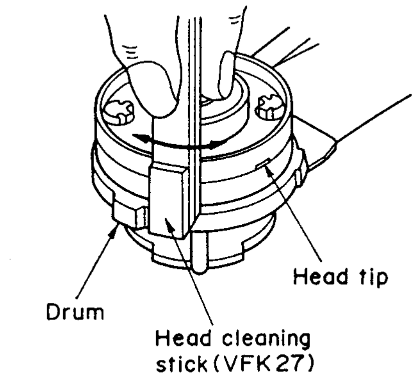
• DAT Head and Tape Transport Cleaning

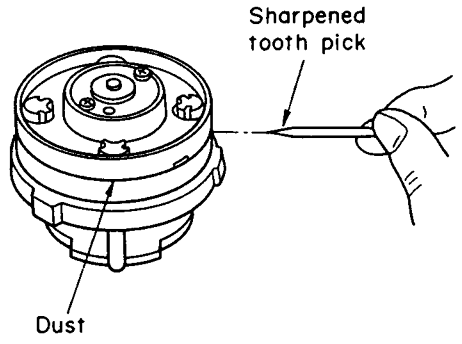
Through normal usage of any tape machine, dirt and debris from the tape accumlates on the heads, which eventually causes performance problems. By using a cleaning cassette regularly, dirt buildup can be minimized, prolonging the life of the tape heads, and also keeping tape posts, tape guides, and the pinch roller clean.

• CLEANING

1. Play the cleaning cassette (Panasonic Part No. RT-RCLP) for 15-20 seconds.
2. Do not use the same part of the cleaning tape more than once.
3. Clean all tape contact surface, including A/C head upper and lower drum, thoroughly with a soft cloth soaked in alcohol.
4. Clean both heads by gently rubbing in a horizontal direction, as depicted, using a head cleaning stick (VFK27) or a lint free cloth moistened with alcohol.
5. Wipe all tape contact surfaces, including upper and lower drum, with a dry soft cloth to ensure that all residual moisture is removed from the tape contact surfaces.

Note:
1. When cleaning the upper drum, hold it secure with your finger tips.
2. Occasionally, dirt or debris may become lodged in the air bearing channels that are cut in the upper drum's surface. This can be removed by gently dislodging it with a sharpened toothpick.
3. Modest amounts of solvent are used Excess alcohol will dilute and remove the bearing lubricant in the capstan motor and rotary guides.

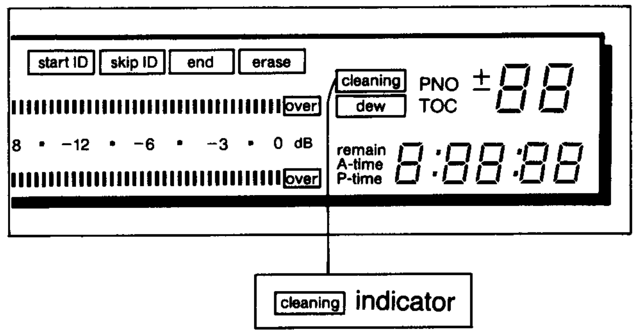




• IMPORTANCE

Check the Error Rates at several points in the tape and average the values. If the Error Rates increase to around 300, a Panasonic Head Cleaner Tape can be used as follows: Play the cleaning tape through the SV-3700 for approximately 15 seconds, and remove it. DO NOT REWIND the cleaning tape, since this action might very well spread previously removed dirt and dust onto an otherwise clean head and transport. After the Head Cleaner Tape has been used up, dispose of it properly and start to use a new one.

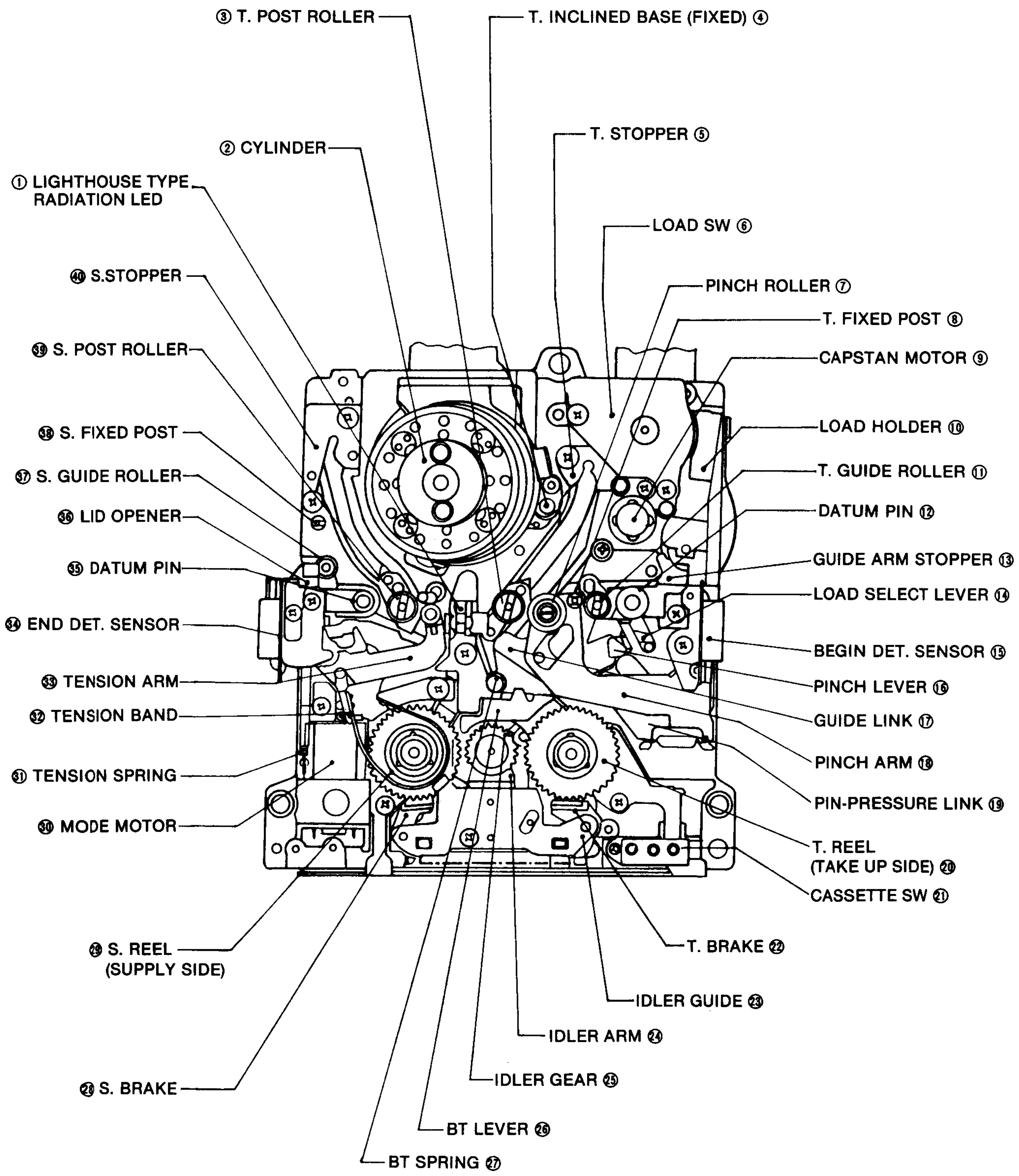
If the DAT heads become very contaminated with dirt and dust, the CLEANING indicator within the display panel will flash. In this case, use a Head Cleaner Tape as described above.



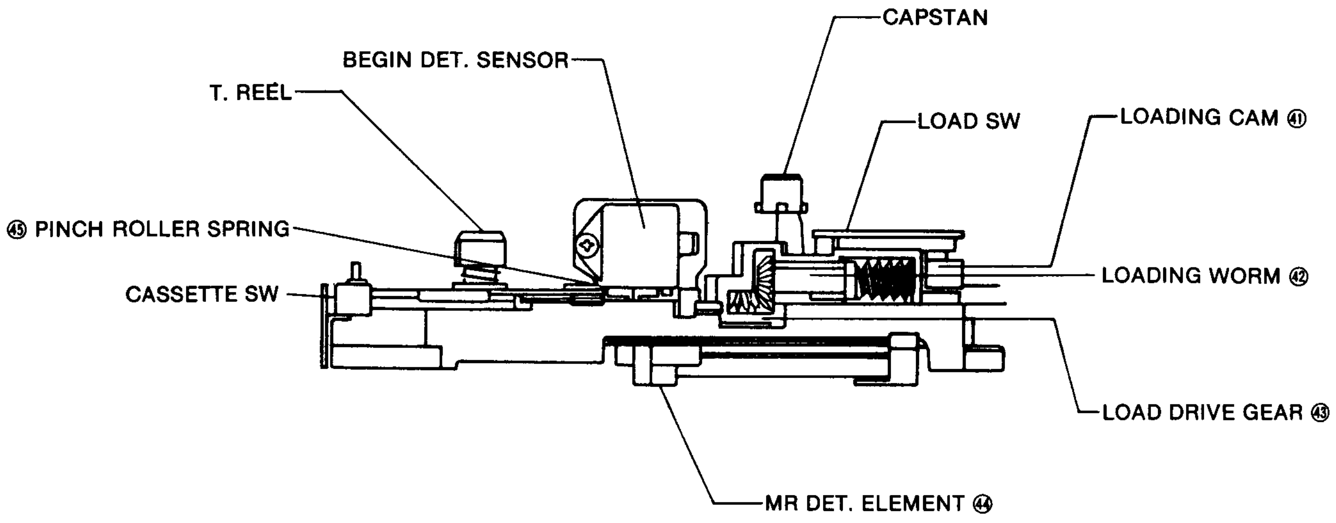
- If playback quality improves after cleaning, but then deteriorates immediately after recording or playing back several times, the cassette tape has probable reached its useful lifetime. In this case, use a new tape.
- If sound quality does not improve even after cleaning, consult your dealer.
- Cleaning tapes cannot be used for recording or playback (be sure to read also the operating instructions supplied with the tape).

• MECHANISM COMPONENT LAYOUT

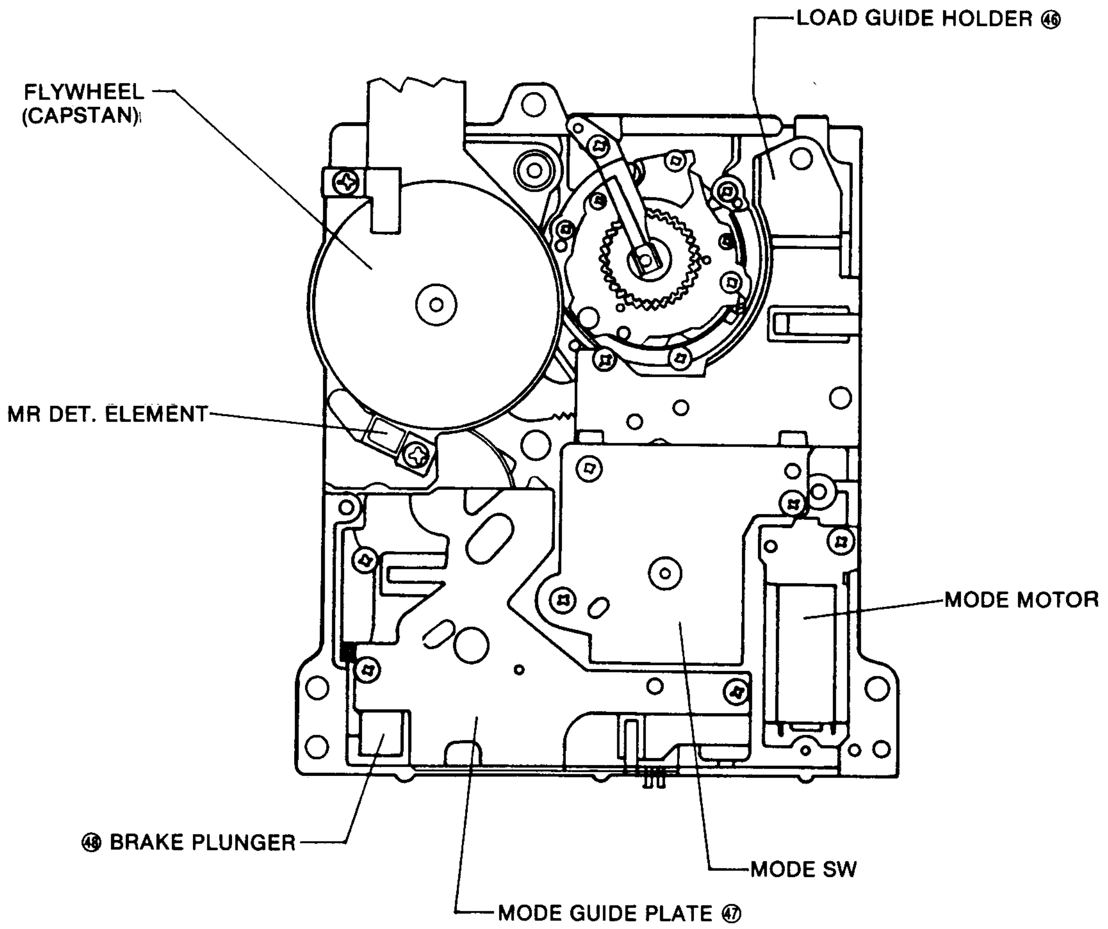
• Top view


③ T. POST ROLLER
T. INCLINED BASE (FIXED) ④
② CYLINDER
T. STOPPER ⑤
① LIGHTHOUSE TYPE RADIATION LED
LOAD SW ⑥
㊵ S.STOPPER
PINCH ROLLER ⑦
T. FIXED POST ⑧
㊴ S. POST ROLLER
CAPSTAN MOTOR ⑨
㊳ S. FIXED POST
LOAD HOLDER ⑩
㊲ S. GUIDE ROLLER
T. GUIDE ROLLER ⑪
㊱ LID OPENER
DATUM PIN ⑫
GUIDE ARM STOPPER ⑬
㉟ DATUM PIN
LOAD SELECT LEVER ⑭
㉞ END DET. SENSOR
BEGIN DET. SENSOR ⑮
㉝ TENSION ARM
PINCH LEVER ⑯
㉜ TENSION BAND
GUIDE LINK ⑰
PINCH ARM ⑱
㉛ TENSION SPRING
PIN-PRESSURE LINK ⑲
㉚ MODE MOTOR
T. REEL (TAKE UP SIDE) ⑳
CASSETTE SW ㉑
T. BRAKE ㉒
㉙ S. REEL (SUPPLY SIDE)
IDLER GUIDE ㉓
IDLER ARM ㉔
㉘ S. BRAKE
IDLER GEAR ㉕
BT LEVER ㉖
BT SPRING ㉗

• Side view


CAPSTAN
BEGIN DET. SENSOR
T. REEL
LOAD SW
LOADING CAM ㊶
㊺ PINCH ROLLER SPRING
LOADING WORM ㊷
CASSETTE SW
LOAD DRIVE GEAR ㊸
MR DET. ELEMENT ㊹

• Bottom view


LOAD GUIDE HOLDER ㊻
FLYWHEEL (CAPSTAN)
MR DET. ELEMENT
MODE MOTOR
㊽ BRAKE PLUNGER
MODE SW
MODE GUIDE PLATE ㊼

• MECHANISM CONTROLS AND FUNCTIONS

① LIGHT HOUSE TYPE RADIATION LED	Lighthouse-shaped, LEDs blink at start and end of tape.
② CYLINDER	30mm in diameter, 40 FG pulses, maintains specified speed of 1000 to 3000rpm.
③ T. POST ROLLER	Regulates tape travel position (upper edge).
④ T. INCLINED BASE (FIXED)	Regulates angle (90°) at which tape is wound around cylinder (stationary).
⑤ T. STOPPER	Determines position of T post roller base during loading.
⑥ LOAD SW	Two-bit rotary switch, detects loading position.
⑦ PINCH ROLLER	Presses against tape during play and review.
⑧ T. FIXED POST	Regulates tape travel position.
⑨ CAPSTAN MOTOR	1.5mm in diameter, 290 FG pulses.
⑩ LOAD HOLDER	Contains loading drive gear and worm gear, engages and disengages M gear A.
⑪ T. GUIDE ROLLER	Regulates tape travel position (top edge).
⑫ DATUM PIN	Regulates width and height (right side) during loading of cassette tape.
⑬ GUIDE ARM STOPPER	Determines position of T guide roller base K during loading.
⑭ LOAD SELECT LEVER	Switches engagement and disengagement of loading gear in accordance with loading conditions.
⑮ BEGIN DET. SENSOR	Light-receiving element for LED (detection at start of tape).
⑯ PINCH LEVER	Presses pinch roller against tape during play and review.
⑰ GUIDE LINK	Links T post roller base and guide roller base.
⑱ PINCH ARM	Comprised of pinch roller and T holding post, presses against the capstan.
⑲ PIN-PRESSURE LINK	Connected by the pin pressure spring and the pinch arm.
⑳ T. REEL (TAKE UP SIDE)	Take-up reel base, 64 FG pulses.
㉑ CASSETTE SW	Detects cassette information (mistaken erasure, cassette detection).
㉒ T. BRAKE	Presses brake gear against reel base gear to perform braking.
㉓ IDLER GUIDE	Holding cover for idler arm and S and T brakes.
㉔ IDLER ARM	Moves left or right in accordance with mode condition, transmits movement of counter gear to S and T reels.

㉕ IDLER GEAR	Transmits movement to S and T reels in accordance with mode.
㉖ BT LEVER	Applies back tension to T reel during review.
㉗ BT SPRING	Provides pressure for back tension lever.
㉘ S. BRAKE	Presses brake shoe against S reel base gear to perform braking.
㉙ S. REEL (SUPPLY SIDE)	Supply reel base, 64 FG pulses.
㉚ MODE MOTOR	6.5V DC motor, switches mode by forward and reverse revolution.
㉛ TENSION SPRING	Provides back tension force of tension regulator.
㉜ TENSION BAND	Mounted to tension regulator, applies back tension to S reel base.
㉝ TENSION ARM	Detects tape condition and applies back tension during play and review.
㉞ END DET. SENSOR	Light-receiving element for LED (detection at end of tape).
㉟ DATUM PIN	Regulates width and height (left side) during loading of cassette tape.
㊱ LID OPENER	Opens cassette lid during loading of tape.
㊲ S. GUIDE ROLLER	Regulates tape travel position (bottom edge).
㊳ S. FIXED POST	Regulates tape travel (bottom edge).
㊴ S. POST ROLLER	Regulates tape travel position (top edge).
㊵ S. STOPPER	Determines position of S post roller base during loading.
㊶ LOADING CAM	Uses movement transmitted from loading worm to move loading lever.
㊷ LOADING WORM	Transmits movement of loading drive gear and loading cam.
㊸ LOAD DRIVE GEAR	Transmits movement of M gear A and loading worm, engages and disengages in accordance with mode.
㊹ MR DET. ELEMENT	Detects magnetic changes (290 pulses) of flywheel.
㊺ PINCH ROLLER SPRING	Mounted to the pinch arm, returns the pinch roller.
㊻ LOAD GUIDE HOLDER	Holding cover of the loading arm and loading lever.
㊼ MODE GUIDE PLATE	Holding cover of the various gears, holds the plunger in position.
㊽ BRAKE PLUNGER	5V, 200mA, switches brakes on and off in accordance with the mode.

■ SYSTEM DISPLAY MODE SELECTION

System Display Mode

The SV-4100 has several operating parameters that can be accessed by the front panel display. In system display mode, these parameters may be checked or altered. The values set in this mode are retained when the power is turned off.

(1) Entering the system display mode

Press the COUNTER MODE + COUNTER RESET + PAUSE buttons (=DISPLAY FUNCTION SELECTORS) simultaneously.
Deck is set to the digital input/output terminal selection mode (mode No.0) of system display mode.
"0-" appears on the program number display.

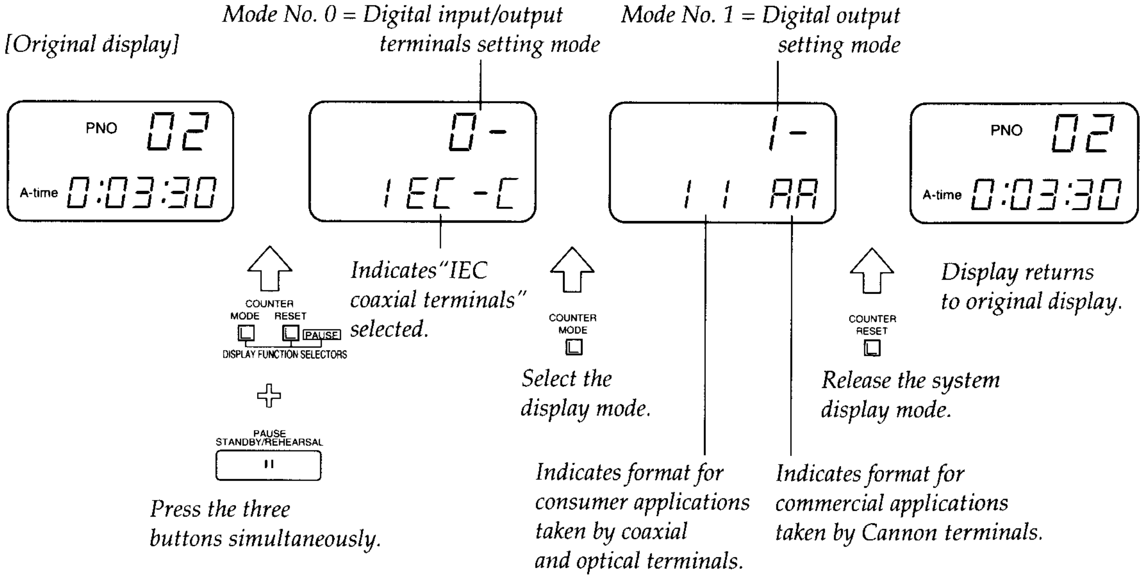
(2) Selecting the display mode

Press the COUNTER MODE button.
Each time the button is pressed, the display mode changes in the order of the mode number.
The mode No. of the selected display mode is displayed.

(3) Returning to the regular display (releasing the system display mode)

Press the COUNTER RESET button.

Selecting the system display mode:


[Original display]
Mode No. 0 = Digital input/output terminals setting mode
Mode No. 1 = Digital output setting mode
PNO 02
A-time 0:03:30
0-
IEC-C
1-
11 AA
PNO 02
A-time 0:03:30
COUNTER MODE RESET
PAUSE
DISPLAY FUNCTION SELECTORS
PAUSE STANDBY/REHEARSAL
Press the three buttons simultaneously.
Indicates "IEC coaxial terminals" selected.
COUNTER MODE
Select the display mode.
Indicates format for consumer applications taken by coaxial and optical terminals.
Indicates format for commercial applications taken by Cannon terminals.
COUNTER RESET
Release the system display mode.
Display returns to original display.

Mode Displays and Their Setting Methods

Selecting the digital input/output terminals (mode No.0)

What is displayed	Actual display	Significance
The currently selected terminals appear on the counter display.	1) IEC-C	"Coaxial terminals" selected.
	2) IEC-0	"Optical terminals" selected.
	3) AES	"XLR-3 terminals" selected.

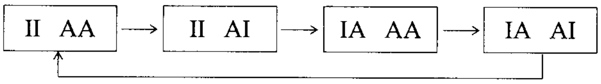
To change the setting:
Press the SETTING button (forward). The display changes in the sequence of 1) through 3) above, thus changing the terminals selected. The setting established after initialization is "IEC-C".

Notes: When "IEC-C" or "IEC-0" has been selected, the digital output signals are supplied from both the coaxial and optical terminals. When "AES" has been selected, the digital output signals are supplied from the XLR-3 terminals only.

Selecting the digital output mode (mode No.1)

What is displayed	Actual display	Significance
The output mode (format for commercial or consumer applications) of the digital output terminals appears on the counter display.	1) II	Format for consumer applications taken by coaxial and optical terminals.
According to standards, the coaxial and optical terminals are for IEC consumer use. The XLR, or Cannon connectors are for AES/EBU professional use. In order to increase compatibility with equipment using non-strandard digital interfaces, this display permits the format and interface connectors to be interchanged. For example, AES/EBU may be sent to the coaxial and optical connectors, while IEC may be sent to the XLR connectors.	2) IA	Format for commercial applications taken by coaxial and optical terminals.
	3) AI	Format for consumer applications taken by XLR-3 terminals.
	4) AA	Format for commercial applications taken by XLR-3 terminals.

To change the setting:
Press the SETTING button (forward). The display changes in the sequence shown below, thus changing the output format. The settings established after initialization are "II" for the coaxial and optical terminals and "AA" for the XLR-3 terminals, which is the standard for IEC and AES/EBU.



Selecting the error rate display (mode No.2)

What is displayed	Actual display
1) The total error rate for data played back by head A and head B appears on the counter display.	"A" and "B" light on the display. The error rate is indicated by (the value displayed/9984).
2) The error rate for data played back by head A appears on the counter display.	Only "A" lights on the display. The error rate is indicated by (the value displayed/4492).
3) The error rate for data played back by head B appears on the counter display.	Only "B" lights on the display. The error rate is indicated by (the value displayed/4492).

To change the setting:
Press the SETTING button (forward). The display changes in the sequence of 1) through 3) above.

Selecting the single play mode (mode No.3)

Single play is a function which suspends playback when a Skip ID or Start ID which has been recorded is detected during playback.
Basically, when single play mode is on, the unit will playback normally until the next Start ID or Skip ID is encountered. The tape will then "park" in PAUSE mode so the next selection is ready for playback at any time. To resume playback, simply press the PLAY button.

What is displayed	Actual display	Significance
The present single play mode setting appears on the counter display.	1) SP- - -	The single play mode has been set to off.
	2) SP-00	The single play mode has been set to on.

The unit operates as follows depending on the operating mode.

Note: Single play mode does not take effect during Program Play, such as when programming a random sequence of selections using the program number and MEMORY buttons on the remote control.

When a Skip ID recorded is detected during playback:

Sequence of priority	Operating mode	When the single play mode is off (normal)	When the single play mode is on
1	* Sub code editing mode	Playback continues.	Playback continues.
2	Skip play cancel mode	Playback continues.	PAUSE mode is established.
3	Skip play mode	The tape advances to the next Start ID and playback mode is established.	The tape advances to the next Start ID and pause mode is established.

When a Start ID recorded is detected during playback:

Sequence of priority	Operating mode	When the single play mode is off (normal)	When the single play mode is on
1	* Sub code editing mode	Playback continues.	Playback continues.
2	Other mode Cancel mode	Playback continues.	PAUSE mode is established.

* Sub-code editing mode: refers to when the Start ID or Skip ID indicator is flashing after either of those buttons has been pressed.

To change the setting:
Press the SETTING button (forward). The mode is switched alternately between on and off. The setting established after initialization is "OFF".

Note: Any ID recorded is ignored if it is detected during the first for two seconds after playback starts.

Selecting the program playback blank skip mode (mode No.4)

Program playback blank skip determines which way the SV-4100 recognizes the end of a program. This is necessary for program play since the machine must skip to a selection at another location on the tape when the currently playing program ends.

When blank skip mode is on, the machine skips to the next programmed selection as soon as it encounters audio level below –42 dB for 2 seconds or more. When blank skip mode is off, the machine skips to the next programmed selection as soon as it encounters the next Start ID or Skip ID following the present program.

What is displayed	Actual display	Significance
The present program playback blank skip mode setting appears on the counter display.	1) PS-00	The program playback blank skip mode has been set to on.
	2) PS- - -	The program playback blank skip mode has been set to off.

To change the setting:
Press the SETTING button (forward). The mode is switched alternately between on and off. The setting established after initialization is "ON".

Note: If the Start ID recorded is detected at the beginning of a blank section, the blank is not skipped until the playback of the recorded section is completed.

Selecting the main ID6 display (mode No.5)

(1) SCMS

The Serial Copy Management System (SCMS) is designed to control digital-to-digital DAT copying that a consumer can perform on various digital audio material, including Compact Discs, pre-recorded DAT tapes, and other material via IEC 958 "consumer use" digital audio interfaces (also commonly referred to as "S/P DIF"). SCMS does not affect the ability to make copies using a DAT recorder's analog inputs and outputs.

Only one serial (or generational) digital-to-digital copy can be made from a copyright protected source, such as a commercial CD or pre-recorded DAT. Serial Copy Management System labels are generated onto tape each time an SCMS-equipped consumer DAT machine records an audio signal to tape, no matter whether the source is from the analog or digital inputs.

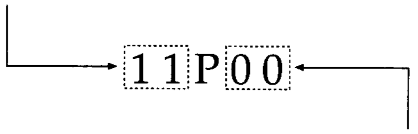
(2) Setting the main ID6

Technically, the SCMS labels for DAT are encoded into the sub code sections of the main digital data area, specifically "main ID6". The SV-4100 allows the user to preset the SCMS status bits of main ID6 onto the DAT recording. For legal reasons, the ID6 bits are only modified if the source input is the AES/EBU Digital I/O; analog input during digital copying via the IEC "consumer use" input, the SV-4100 simply copies across the current status of SCMS codes from the source tape.

What is displayed	Actual display	Significance (When using consumer- type DAT recorder)
The two digits on the left show the value of main ID6 that are user-selectable and will be recorded onto tape when using the analog inputs or the AES/EBU Digital Input terminal. The two digits on the right show the actual main ID6 value recorded on the tape.	1) 00	ID6 value set to 00: Copy-free. Unlimited digital copies can be made from the source tape or its copies.
	2) 11	ID6 value set to 11: Copy-restricted. Digital copies can be made from the source tape with this code, but the copies cannot be duplicated digitally.
	3) 10	ID6 value set to 10: Copy-prohibited. Digital copies cannot be made using a consumer type DAT Recorder.

Display example: When "11P00" is displayed

The first two digits denote the value of main ID6 which is "user-selectable bits" and to be recorded onto the tape during recording. In this case, these digits are "11."



The last two digits denote the value of main ID6 which has been recorded onto the tape being played back. In this case, these digits are "00."

To change the setting:

Press the SETTING button (forward). The display changes in the sequence of 1) through 3) above, thus changing the value of main ID6 which is to be recorded onto the tape during recording. The setting established after initialization is "00."

Setting the monitor output attenuate level (mode No.6)

Various types of audio equipment work at different reference levels. The monitor output attenuate level reduces the level of the analog outputs. This feature, when used in combination with the +4/–10 dB pad switch, makes it possible to vary the analog output level over a 28 dB range. This virtually eliminates any likelihood of level incompatibility with other equipment.

(1) Attenuate level setting methods

This level can be set in the following 3 ways.

1) The level is set using the SETTING buttons or SETTING dial.
2) The level which has been preset in one of the LOCATE button is used.
3) The level is defined by the user by the LOCATE LAST button and recalled for use.

(2) Setting the attenuate level

Button operated	Operation	Display
SETTING button (forward or reverse)	Each time the forward button is pressed, the setting is incremented by 1; conversely, each time the reverse button is pressed, the setting is decremented by 1.	The digital attenuate setting appears on the counter display.
SETTING dial	The setting is continuously incremented or decremented by turning the dial in the UP or DOWN direction.	

The attenuate level (DATT) can be set from 200 (approx. –14 dB) to 1024 (0 dB). The attenuate level is $20 \times \log_{10} \frac{(DATT)}{1024}$ [dB]. The setting established after initialization is 1024.

(3) Using a preset level in a LOCATE button

There are four factory preset levels programmed into LOCATE 1-4 buttons which can be easily recalled by simply pressing the buttons.

Example: Press the LOCATE button 2 to set the level to –2 dB. While this button is kept depressed, the decibel level ("-2" in this case) is displayed and when the button is released, it is set to a value (813) for establishing the -2 dB level.

LOCATE button No.	Default setting	Display
LOCATE 1	–0 dB (=1024)	"–00"→A1024
LOCATE 2	-2 dB (=813)	"–02"→A0813
LOCATE 3	–4 dB (=646)	"–04"→A0646
LOCATE 4	–6 dB (=513)	"–06"→A0513

(4) Using a setting which has been entered by the user in the LOCATE LAST button by recalling it

Setting method:
Set the attenuate level to the desired value.
Keep the LOCATE LAST button depressed (for at least 1.5 or so sec.).
After "- - -" is displayed, "-PP" appears indicating the value is stored.

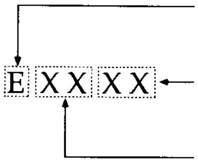
Recall method:
Press the LOCATE LAST button for a short duration (less than 1.5 or so sec.).
The entered setting is displayed.
The value recalled is set.

Displaying the head cylinder rotation time (mode No.7)

This is an hour meter which increments any time the head cylinder rotates.
The total cylinder rotation time is indicated on the counter display in 5 digits (hours).
Use this as a guide to determine when your deck needs maintenance.

Displaying the error codes, etc. (mode No.8)

The following four test results appear on the counter display.

What is displayed	Description of function	Actual display	Significance
1) Error code	Display of the system controller and mechanism controller error codes. When the cassette tray is opened, the error code display mode is released. These codes are primarily to aid diagnosis of any malfunction. Refer to qualified service personnel if you should ever experience a problem.	Example: 	Denotes that this is the error code display mode. Mechanism controller error code System controller error code
2) Microcomputer operation mode	Not available to users	—	—
3) Microcomputer software version	The version of the system controller is displayed.	Example: "1-00"	In this case, version 1.00 is denoted.

To select what is to be displayed:
Press the SETTING button (forward). The display is changed in the sequence of 1) through 3) above, and the test results are displayed.

Re-initializing all stored data settings

Press the EXT SYNC + TIME INPUT + COUNTER RESET buttons simultaneously.
All the settings except for the value indicated for the cylinder rotation time are reset to the initialized value.
When this operation is received, "00000" appears on the counter display.

List of settings which are retained even when the power is turned off

Setting to be retained	Setting in the system display mode	Initialization setting
Selecting the digital input/output terminals	●	IEC-C
Selecting the digital output terminals mode	●	II AA
Setting the single play mode	●	OFF
Setting the program play blank skip mode	●	ON
Selecting the main ID6 to be recorded	●	ID6=00
Setting the monitor output attenuate level	●	–0 dB
The total cylinder rotation time	●	No initialization possible
Setting the quick start play mode	—	OFF
Setting the PNO/START ID AUTO mode	—	ON
Setting the SKIP PLAY CANCEL mode	—	ON
Selecting the external sync mode	—	Internal
Setting the A-Time in the LOCATE button	—	0

If "EEEEE" appears for 1 second on the counter display when the power has been turned on:
This indicates that the data back-up function described above is not working properly.

OPERATION CHECKS AND MAIN COMPONENT REPLACEMENT PROCEDURES

NOTE

1. **This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.**
2. **For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.**
3. **Select items from the following index when checks or replacement are required.**
4. **Illustrated screws are equivalent to actual size.**
5. **Refer the parts No. on the page of "Main component Replacement Procedures", if necessary.**

• Contents

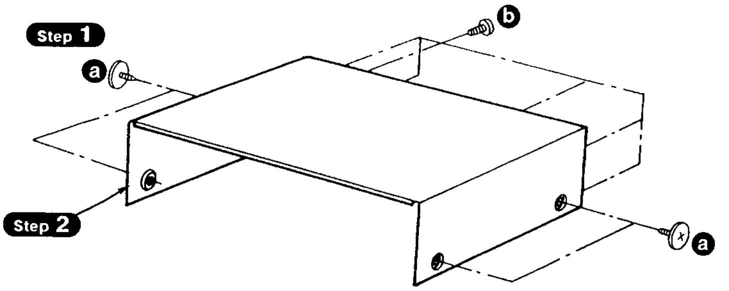
•Checking Procedure for each P.C.B. page.
1. Checking for the operation P.C.B. and headphones jack P.C.B. •••••••••••••••••••••••••••••••••••••20.
2. Checking for the power supply P.C.B. •••21.
3. Checking for the main P.C.B. ••• 21,22
4. Checking for the servo P.C.B. ••22.
5. Checking for the RF P.C.B. •••••••••••••••• •••22,23.

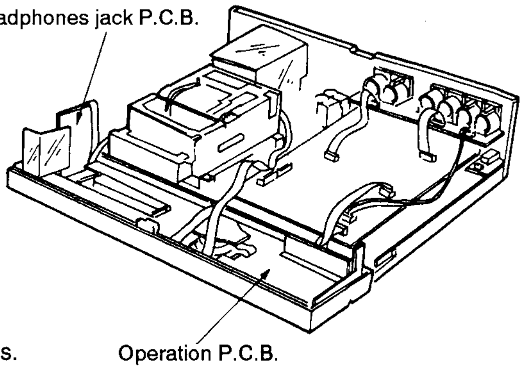
•Main Component Replacement Procedures
1. Replacement for the regulator IC• •• 24.
2. Replacement for the upper cylinder ••24,25.
3. Replacement for the belt and motor ass'y •••25.

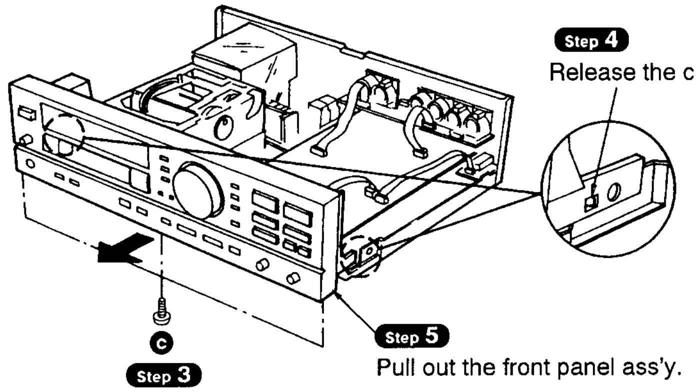
Checking Procedure for each P.C.B.

1. Checking for the operation P.C.B. and headphones jack P.C.B.

•Check the operation P.C.B. and headphones jack P.C.B. as shown below.

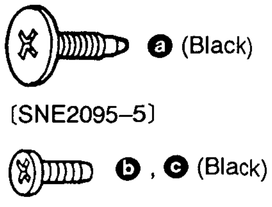




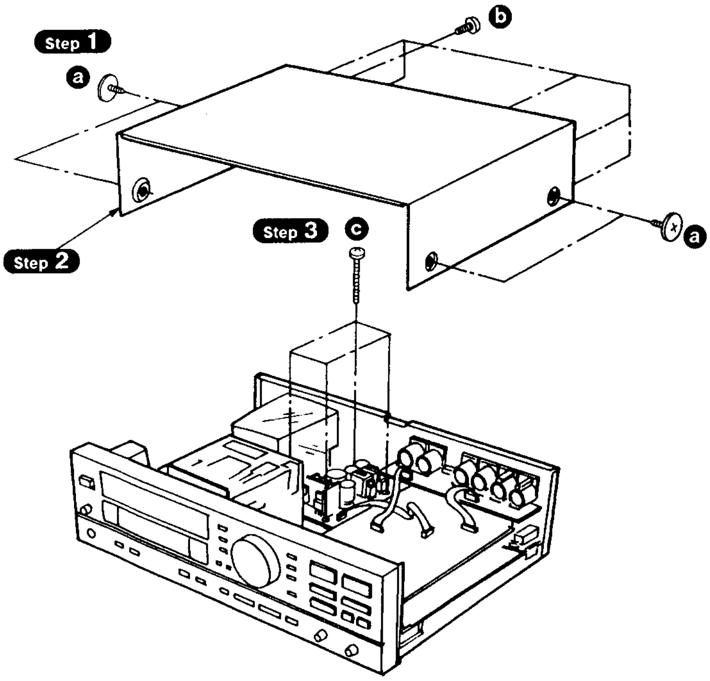


Step 4 Release the claws.

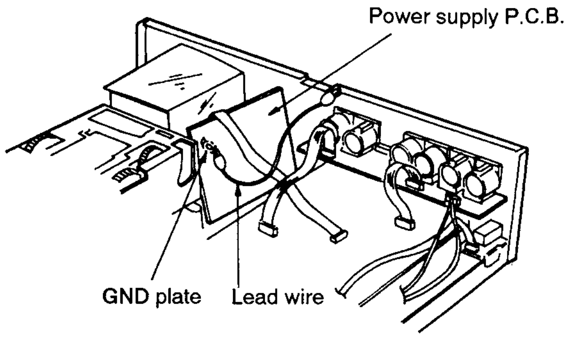
Step 5 Pull out the front panel ass'y.

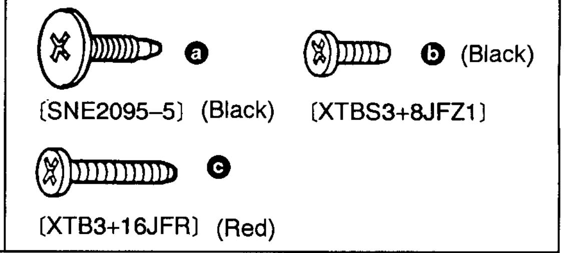


2. Checking for the power supply P.C.B.

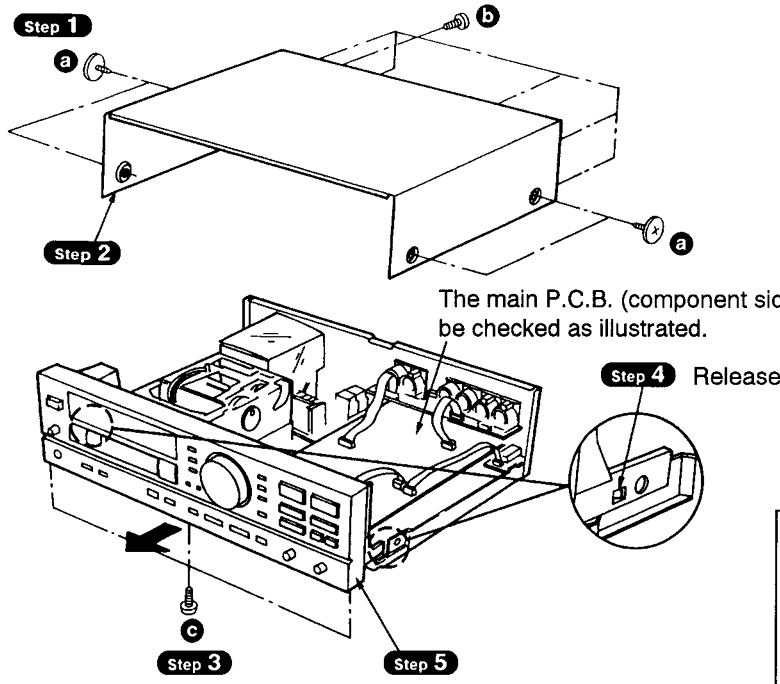

Step 1
a
b
Step 2
Step 3
c
a

•Check the power supply P.C.B. as shown below.


Power supply P.C.B.
GND plate
Lead wire


a
(SNE2095–5) (Black)
b (Black)
(XTBS3+8JFZ1)
c
(XTB3+16JFR) (Red)

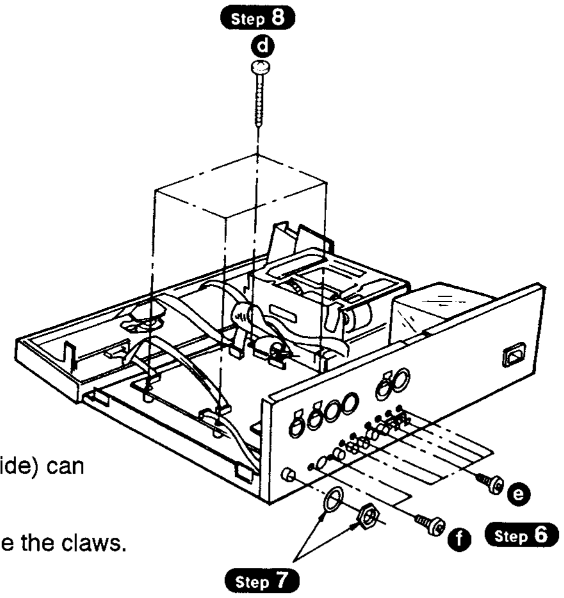
3. Checking for the main P.C.B.

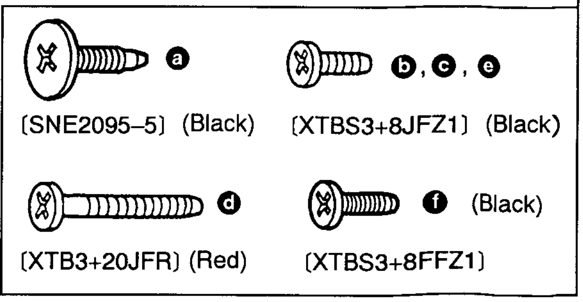

Step 1
a
b
Step 2
a
Step 4
c
Step 3
Step 5

The main P.C.B. (component side) can be checked as illustrated.

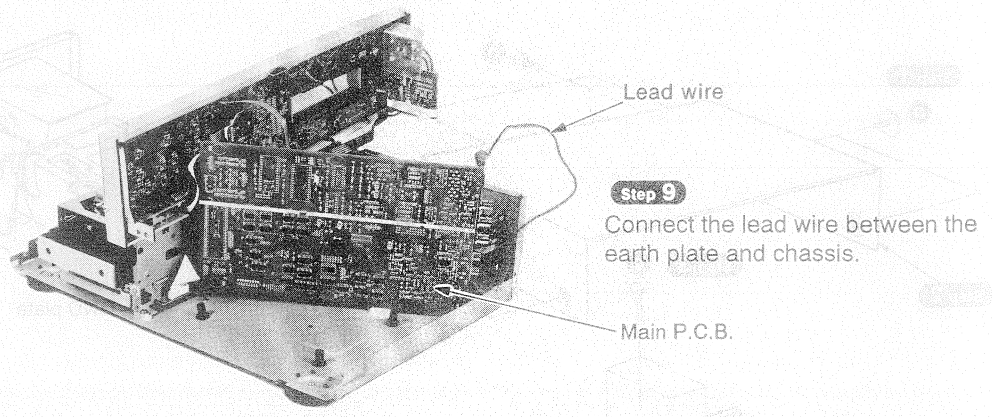
Step 4 Release the claws.

Step 5 Pull out the front panel ass'y.


Step 8
d
e
f
Step 6
Step 7


a
(SNE2095–5) (Black)
b, c, e
(XTBS3+8JFZ1) (Black)
d
(XTB3+20JFR) (Red)
f (Black)
(XTBS3+8FFZ1)

•Check the main P.C.B. (back side) as shown below.

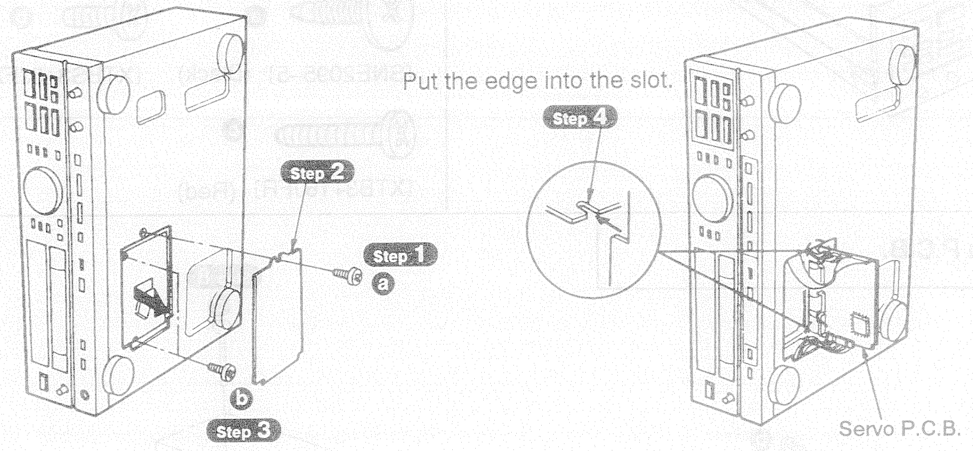

Lead wire
Main P.C.B.

Step 9
Connect the lead wire between the earth plate and chassis.

4. Checking for the servo P.C.B.

ⓐ (Black)
〔XTBS3+8JFZ1〕

ⓑ (Black)
〔XTB3+6F〕

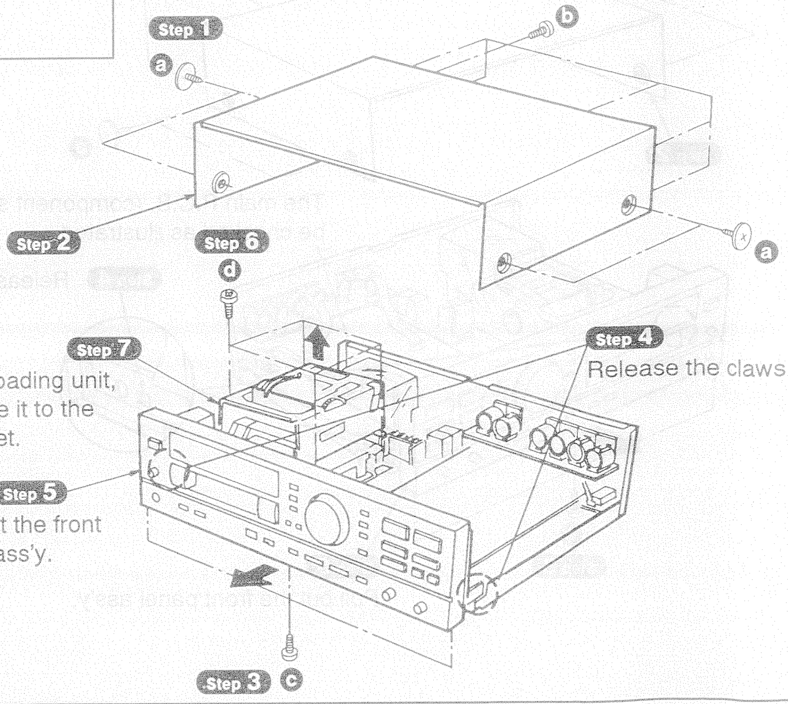

Step 1
ⓐ
Step 2
ⓑ
Step 3
Step 4
Servo P.C.B.

Put the edge into the slot.

NOTE
Take care not to short circuit the servo P.C.B. with chassis.

• Check the servo P.C.B. as shown above.

5. Checking for the RF P.C.B.


Step 1
ⓑ
ⓐ
ⓐ
Step 2
Step 6
ⓓ
Step 3
ⓒ

Step 4
Release the claws.

Step 7
Remove the loading unit, and then place it to the right side of set.

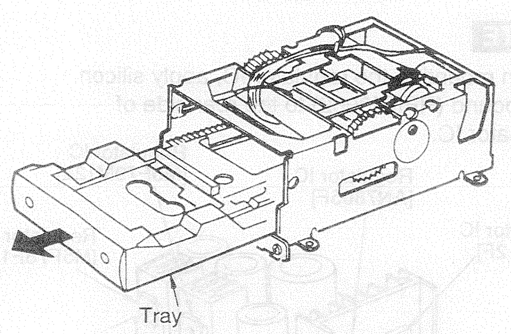
Step 5
Pull out the front panel ass'y.

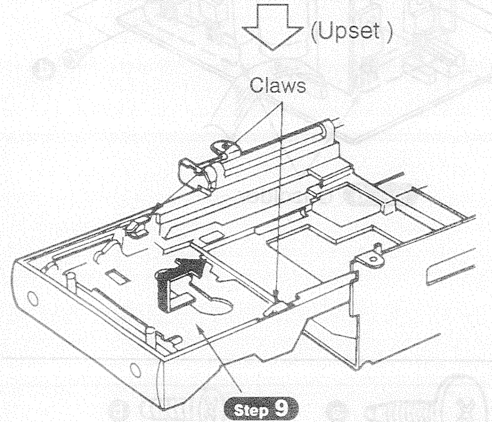
ⓐ
〔SNE2095–5〕 (Black)

ⓑ, ⓒ
〔XTBS3+8JFZ1〕 (Black)

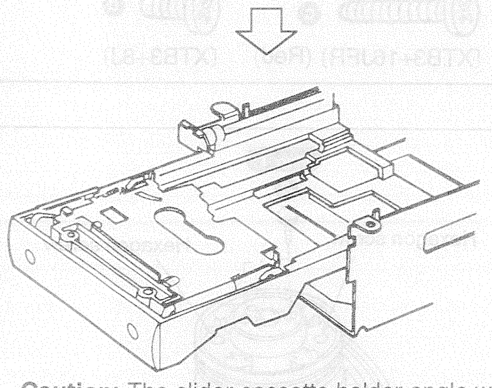
ⓓ
〔XTB3+6F〕

Step 8 Rotate the pulley gear, and then move the tray forward.

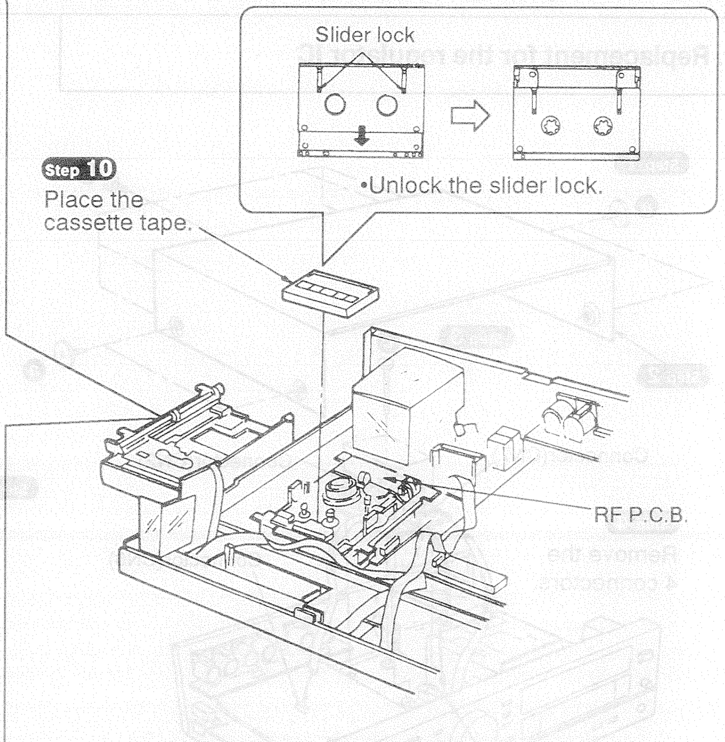



(Upset)
Claws

Step 9 Put the slider cassette holder angle on the claws.



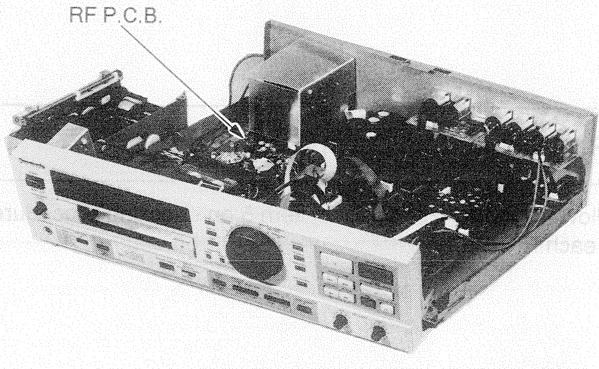
Caution: The slider cassette holder angle will be deformed if it is left as is.


Slider lock
RF P.C.B.

Step 10 Place the cassette tape.

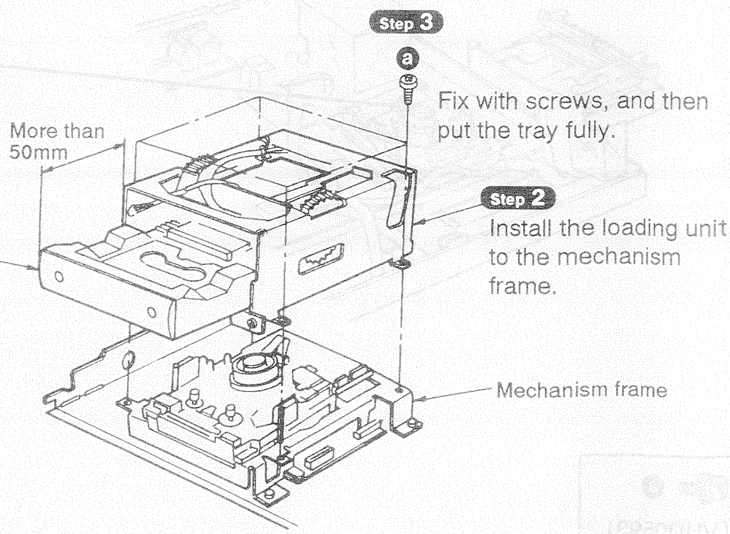
•Unlock the slider lock.

•Check and adjust the RF P.C.B. as shown below.



Fix the cassette tape with adhesive tape.

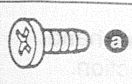
Notice for reassembling the loading unit


a
More than 50mm
Mechanism frame

Step 1 Draw the tray forward more than 50mm.

Step 2 Install the loading unit to the mechanism frame.

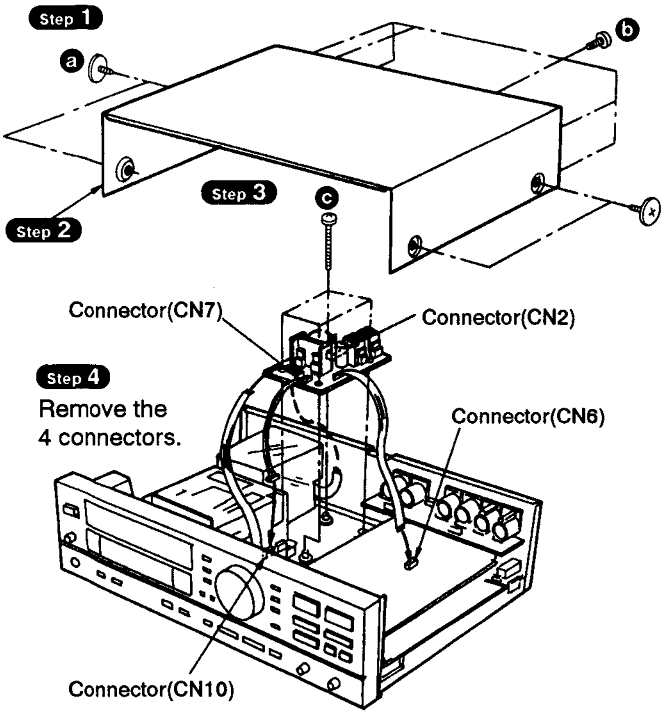
Step 3 Fix with screws, and then put the tray fully.



[XTB3+6F]

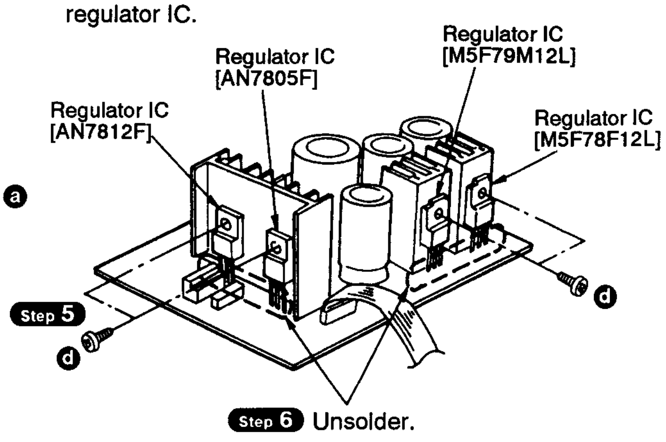
Main Component Replacement Procedures

1. Replacement for the regulator IC


Step 1
a
b
Step 2
Step 3
c
a
Connector(CN7)
Connector(CN2)
Step 4
Remove the 4 connectors.
Connector(CN6)
Connector(CN10)

NOTE

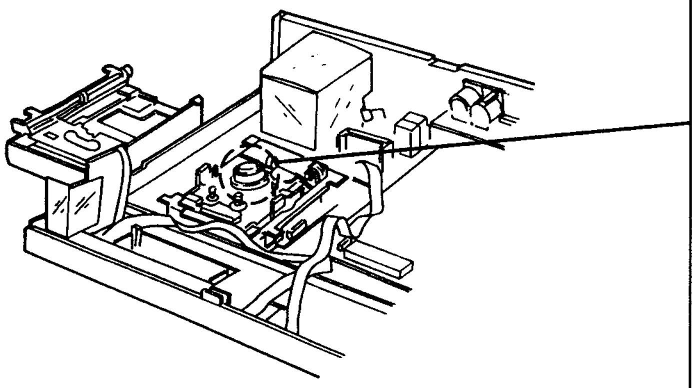
When mounting the regulator IC, apply silicon compound (RFKX0002) to the rear side of regulator IC.


Regulator IC [AN7812F]
Regulator IC [AN7805F]
Regulator IC [M5F79M12L]
Regulator IC [M5F78F12L]
Step 5
d
d
Step 6 Unsolder.

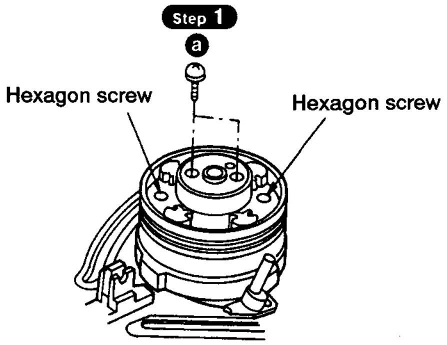
ⓐ	ⓑ
[SNE2095–5] (Black)	[XTBS3+8JFZ1](Black)
ⓒ	ⓓ
[XTB3+16JFR] (Red)	[XTB3+8J]

2. Replacement for the upper cylinder

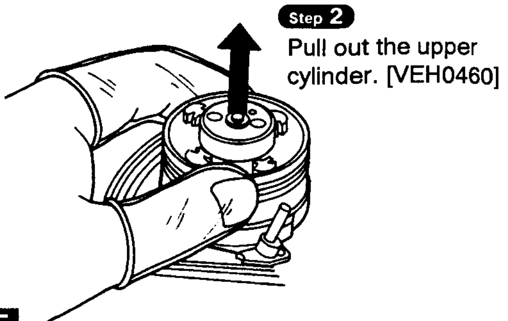
•Follow Step 1 ~ Step 6 in item 5 on checking procedure for each P.C.B..



ⓐ [VHD0593]


Step 1
a
Hexagon screw
Hexagon screw

NOTE Please do not touch hexagon screws.

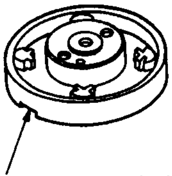


Step 2 Pull out the upper cylinder. [VEH0460]

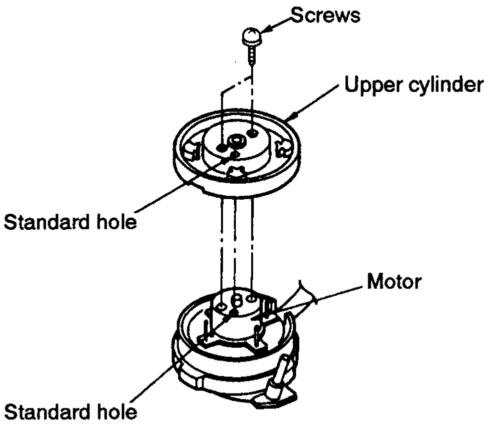
NOTE

Do not touch the cylinder (head) with your bare hand; always be sure to wear a glove or other protection.

Notice for installing the Upper cylinder



NOTE Be sure not to touch the head part.

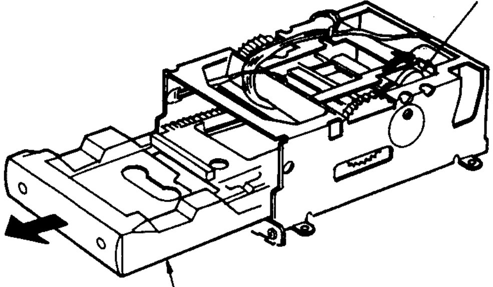

Screws
Upper cylinder
Standard hole
Motor
Standard hole

- Mount the upper cylinder matching the motor's standard hole with the cylinder.

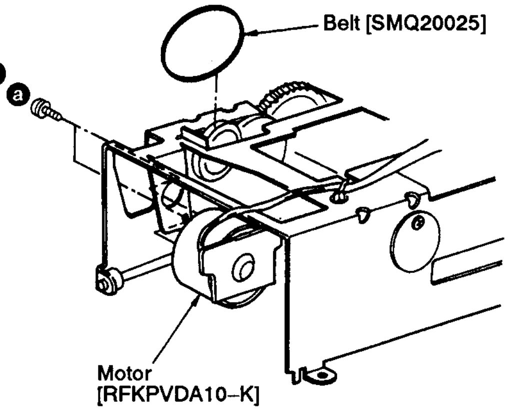
3. Replacement for the belt and motor ass'y

- Follow **Step 1** ~ **Step 6** in item 5 on checking procedure for each P.C.B..

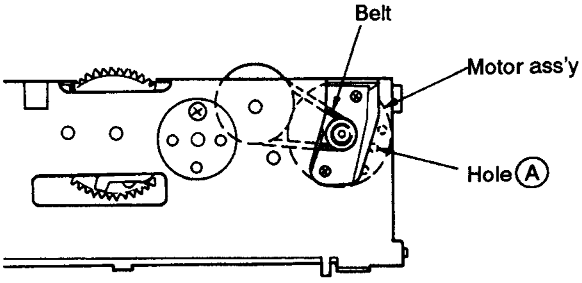
Step 1
Rotate the pulley gear, and then draw the tray forward.



Step 2


a
Belt [SMQ20025]
Motor
[RFKPVDA10–K]

Installing the motor ass'y


Belt
Motor ass'y
Hole Ⓐ

- Install the motor ass'y so that the hole Ⓐ is located as shown above.

[XYN26+C33]

MEASUREMENTS AND ADJUSTMENTS

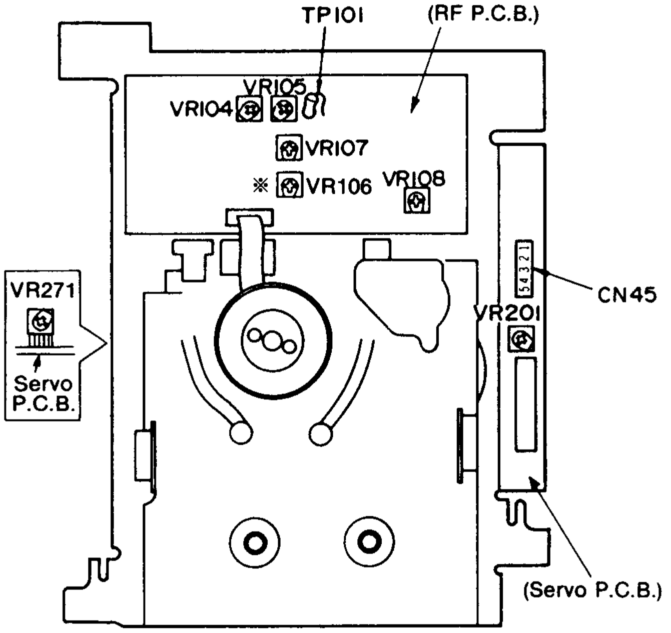
• PREPARATION

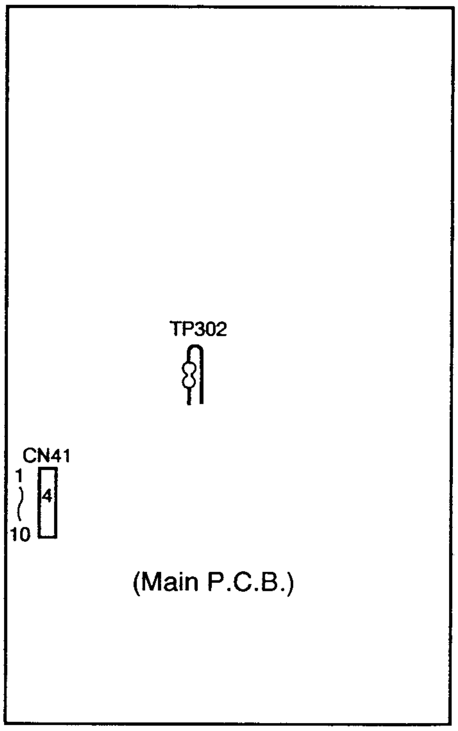
Refer to the "5. Checking for the RF P.C.B." of operation check and main camponent replacement procedure on page 22.

• ELECTRICAL ADJUSTMENT

• Adjustment points

※ VR106 do not require adjustment; if the VR is replaced or require readjustment, set the dial to the center positions.


TP101
(RF P.C.B.)
VR105
VR104
VR107
※ VR106
VR108
VR271
Servo P.C.B.
5 4 3 2 1
CN45
VR201
(Servo P.C.B.)


TP302
CN41
1
4
10
(Main P.C.B.)

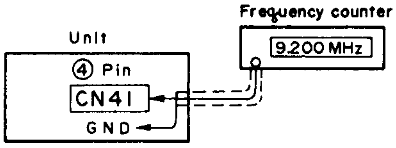
Equipment and Tools

- 2-channel 30MHz oscilloscope with external trigger and dual time base
- 2 oscilloscope probes (10 : 1)*
- Frequency counter
- AF oscillator (OSC)
- Distortion analyser
- DC electronic voltmeter (EVM)
- Post roller adjustment screwdriver
  : SZZV1102C
- Standard test tapes
  : RD-PG01 (PG reference tape)
  : RD-ER01 (Error rate tape)
  : RD-LR02 (Linearity adjustment tape)
- Blank DAT cassette for recording and playback
  : RT-R60P, RT-R90P, RT-R120P
- Standard electrical tools and equipment

* **NOTE:** The oscilloscope voltage settings in the charts and the waveform examples assume use of the specified 10: 1 probes.

1. PLL Free Run Adjustment

1. Connect the frequency counter as shown in figure.
2. Set the power switch to "**ON**".
3. Open the cassette holder drawer.
4. Adjust **VR108** as required until the frequency counter reads **9.2±0.2MHz.**

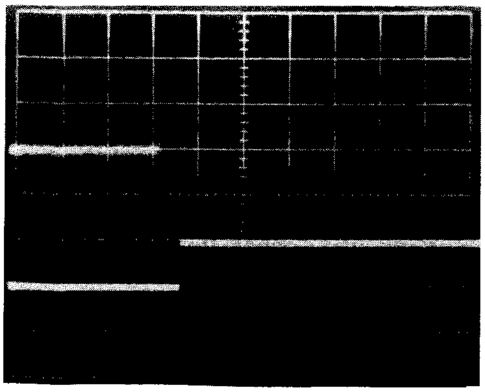

Frequency counter
9.200 MHz
Unit
④ Pin
CN41
GND

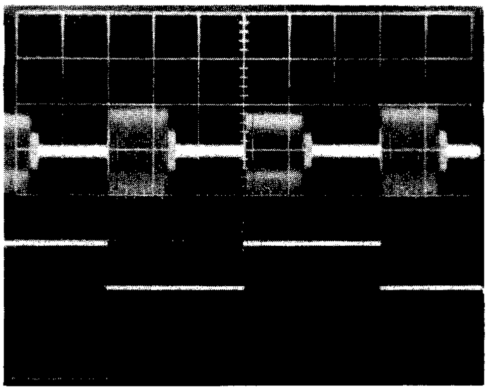
2. PG Phase Adjustment

1. Set up the oscilloscope and connect as shown below.

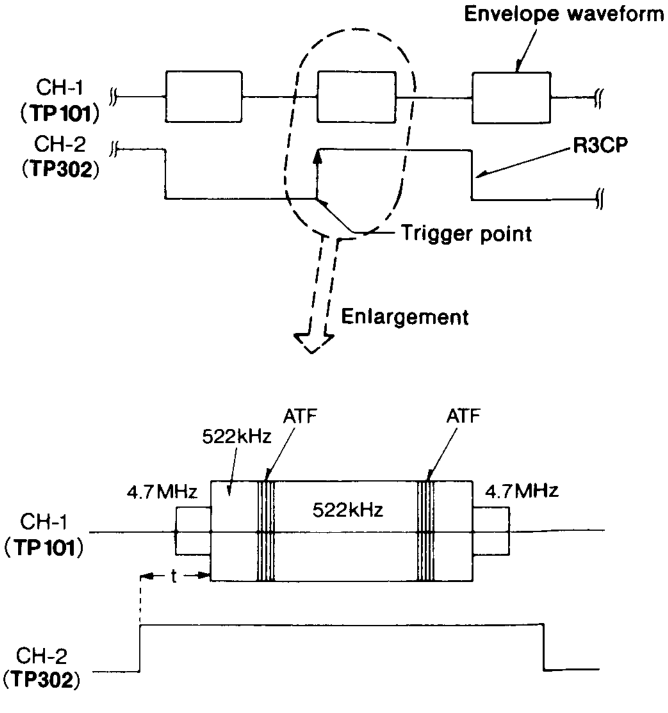
	CH-1	CH-2
Test point	**TP101 (RPRF)**	**TP302 (R3CP)**
Volts/Div.	50mV	0.5V
Time/Div.	5msec.	
Delay Time/Div.	50μsec.	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**VR201**	

2. Note the "t" time indicated on the PG reference tape (RD-PG01), then load and play the tape.
3. While the tape is being played, the waveform shown on the right should appear.
4. Adjust the delay time for the dual time base to display the leading edge of the CH-2 (R3CP) waveform.
5. The time from the leading edge of R3CP to the leading edge of the **522kHz** portion of the RF wafeform must be within **±40μsec** of the time indicated on the PG reference tape. Adjust **VR201** as required, so that the time "t" (in the figure below), falls within specified limits.





Note:
If the output levels of heads A and B are not equal, the "ATF RF Recording Level Adjustment" described in procedure 4 might be made improperly. Adjust the ATF RF Recording Level by following procedure 4 and then check the output level of the heads again. (At this time, it is not necessary to make adjustment dascribed in procedure 2.)


Envelope waveform
CH-1
(TP101)
CH-2
(TP302)
R3CP
Trigger point
Enlargement
ATF
522kHz
ATF
4.7MHz
522kHz
4.7MHz
CH-1
(TP101)
t
CH-2
(TP302)

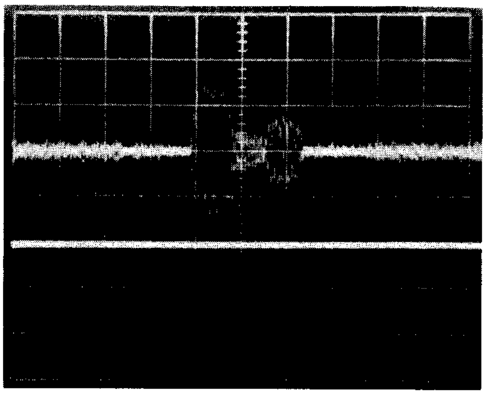
t: Value (μsec) indicated on the standard tape ±40μsec.

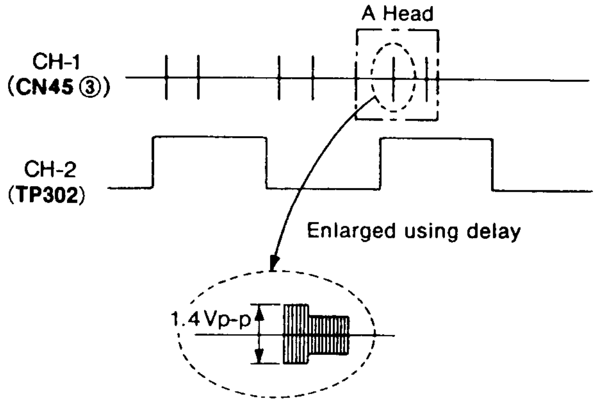
3. ATF Gain Adjustment

1. Set up the oscilloscope and connect as shown below.

	CH-1	CH-2
Test point	**CN45 ③ (PILOT)**	**TP302 (R3CP)**
Volts/Div.	50mV	0.5V
Time/Div.	5msec.	
Delay	0.1msec.	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**VR107**	

2. Load and play the error rate tape (RD-ER01).
3. Adjust the delay time for the dual time base to select and display the PILOT signal with the largest amplitude.
4. Adjust **VR107** so that the amplitude of the PILOT signal is **1.4±0.2Vp-p**. Check the amplitudes of the other PILOT signals to insure that they are a minimum of **1.2Vp-p**. If not optimize the adjustment of **VR107** for the minimum signal level.





4. ATF RF Recording Level Adjustment

NOTE: This adjustment should only be made after confirming the playback "ATF Gain Adjustment" in step 3 above. Failing to do so will invalidate this adjustment.

1. Make a "0" level recording:
    - (a) Load a blank tape (RT-R60P etc.) into the unit.
    - (b) Put the unit into RECORD mode.
    - (c) Run the tape, recording for a minimum of 20 to 30 seconds.
    - (d) Rewind the tape to the beginning of the "0" level signal recording.
2. Connect and set up the oscilloscope as follows:

	CH-1	CH-2
Test point	**CN45 ③ (PILOT)**	**TP302 (R3CP)**
Volts/Div.	50mV	0.5V
Time/Div.	2msec.	
Delay Time/Div.	0.2msec.	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**VR104**: Head A, **VR105**: Head B	

3. While playing back the blank signal portion of the tape, verify that the signal amplitude falls in the range of **1.4±0.2Vp-p**.

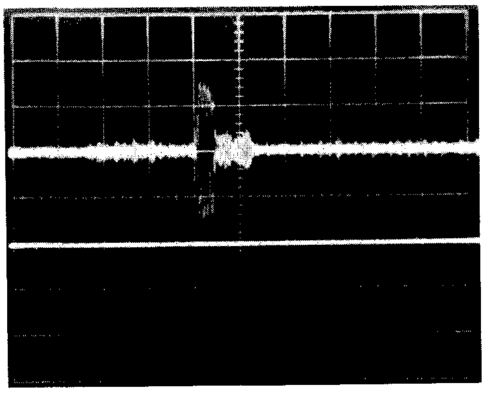
Standard value: 1.4±0.2Vp-p

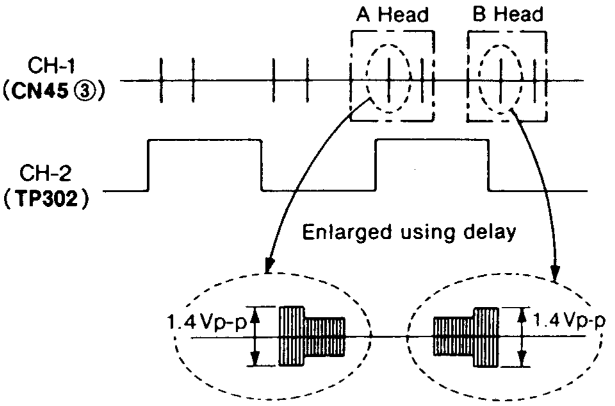
4. If the ATF signal is not within specification press the stop button and adjust **VR104** and **VR105** accordingly. Making finer adjustments as the trials approach the specified level.

LEVEL/HEAD	A: **VR104**	B: **VR105**
More than 1.6V	Turn ↻	Turn ↻
Less than 1.4V	Turn ↺	Turn ↺

After making the adjustment, make another blank signal recording, on a different portion of the tape (use the END SEARCH feature), for 20 to 30 seconds. Rewind the tape to the beginning of the new recording and repeat from step 3 until the specification is met.

Note:
It is necessary to use a different portion of the tape for each trial because DAT does not erase the original signal, it "over writes" the new signal. Using a new portion of the tape will prevent maladjustment due to incomplete "over write" of the previously recorded signal.




A Head
B Head
CH-1
(CN45③)
CH-2
(TP302)
Enlarged using delay
1.4Vp-p
1.4Vp-p

5. BOT/EOT Detection Sensitivity Verification and Adjustment

1. Make sure that the tape stops with the leader portion (the beginning and ending portion).

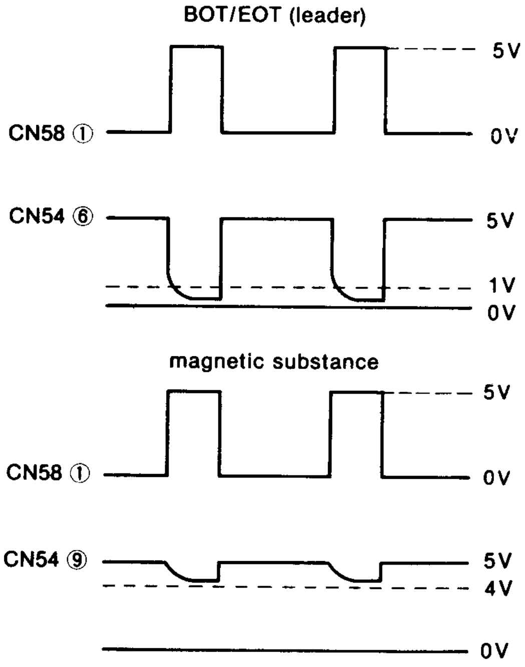
※ If the tape does not stop at the leader, make adjustment by following procedure outlined below.

①Insert a blank tape into the tape compartment of the set and press the playback button at the end of the tape.

②Set up the oscilloscope and connect as shown below.

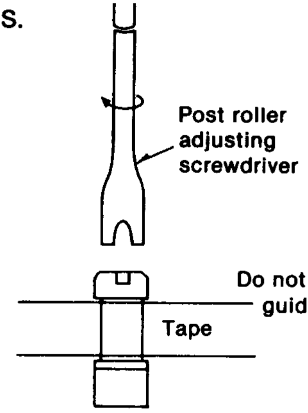
	CH-1	CH-2
Test point	**CN54** ⑥(BOT/EOT) ⑨(magnetic substance)	**CN58** ①
Volts/Div.	0.2V	0.2V
Time/Div.	2msec.	
Delay	——	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**VR271**	

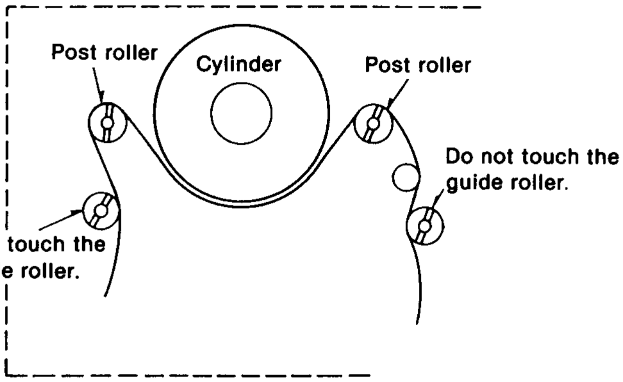
③Adjust the amplitude of waveform to less than **1V** at the magnetic substance and more than **4V** at the leader on **VR271**.


BOT/EOT (leader)
CN58 ①
5V
0V
CN54 ⑥
5V
1V
0V
magnetic substance
CN58 ①
5V
0V
CN54 ⑨
5V
4V
0V

6. Linearity Adjustment

CAUTION: ONLY THE POST ROLLERS ARE USED FOR THE LINEARITY ADJUSTMENT. DO NOT ADJUST THE GUIDE ROLLERS.
THIS ADJUSTMENT IS VERY CRITICAL AND AFFECTS COMPATIBILITY WITH OTHER DAT RECORDERS.

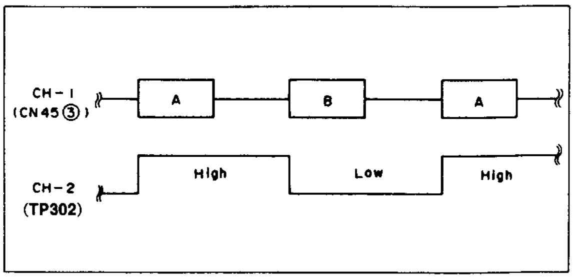

Post roller adjusting screwdriver
Tape


Post roller
Cylinder
Post roller
Do not touch the guide roller.
Do not touch the guide roller.

1. Connect and set up the oscilloscope as follows:

	CH-1	CH-2
Test point	**CN45 ③ (PILOT)**	**TP302 (R3CP)**
Volts/Div.	0.2V	2.0V
Time/Div.	Ⓐ 5msec. Ⓑ 1msec. Ⓒ 0.2msec.	
Delay Time/Div.	——	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**Post rollers (only)**	

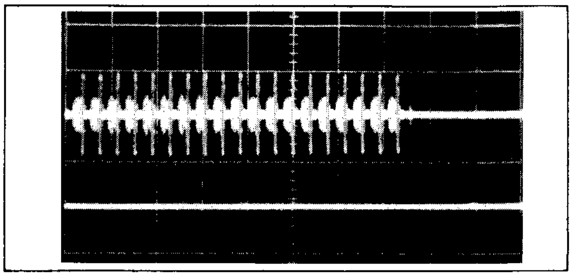
Ⓐ

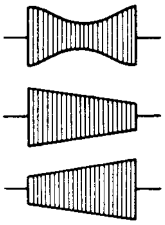


2. Load and play the linearity adjustment tape (RD-LR02). Please use the recorded signal portion on tape (after 600 count from begining of tape)
3. Use the leading edge of the CH-2 (R3CP) waveform to trigger the oscilloscope to monitor the head "A" side of the RF signal envelope.
4. While the tape is playing, gradually adjust the height of the POST ROLLERS until the RF envelope (B) is rectangular.

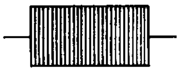
Ⓑ

(OK)





(NG)



(OK)

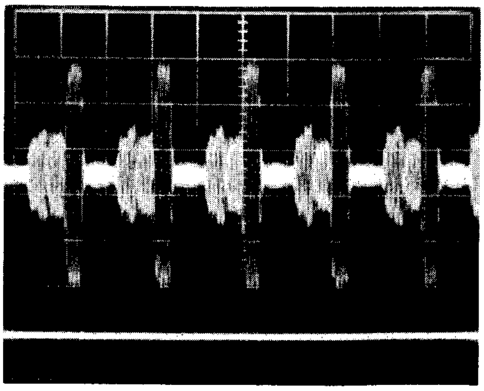
CAUTION 1:
ADJUSTMENTS MUST BE MADE VERY GRADUALLY.

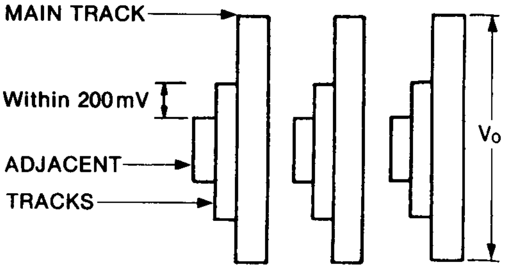
CAUTION 2:
DO NOT "OVER ADJUST" the POST ROLLERS. It is unlikely that the POST ROLLERS will require more than a QUARTER of a turn in either direction to make the waveform rectangular.

5. Adjust **VR107** so that the amplitude (V_0) of the PILOT waveform Ⓒ is **1.0Vp-p**.

6. On the PILOT signal waveform Ⓒ, verify that the amplitude difference between adjacent tracks falls **within 200mV** (See figure below). If not, adjust the post rollers.

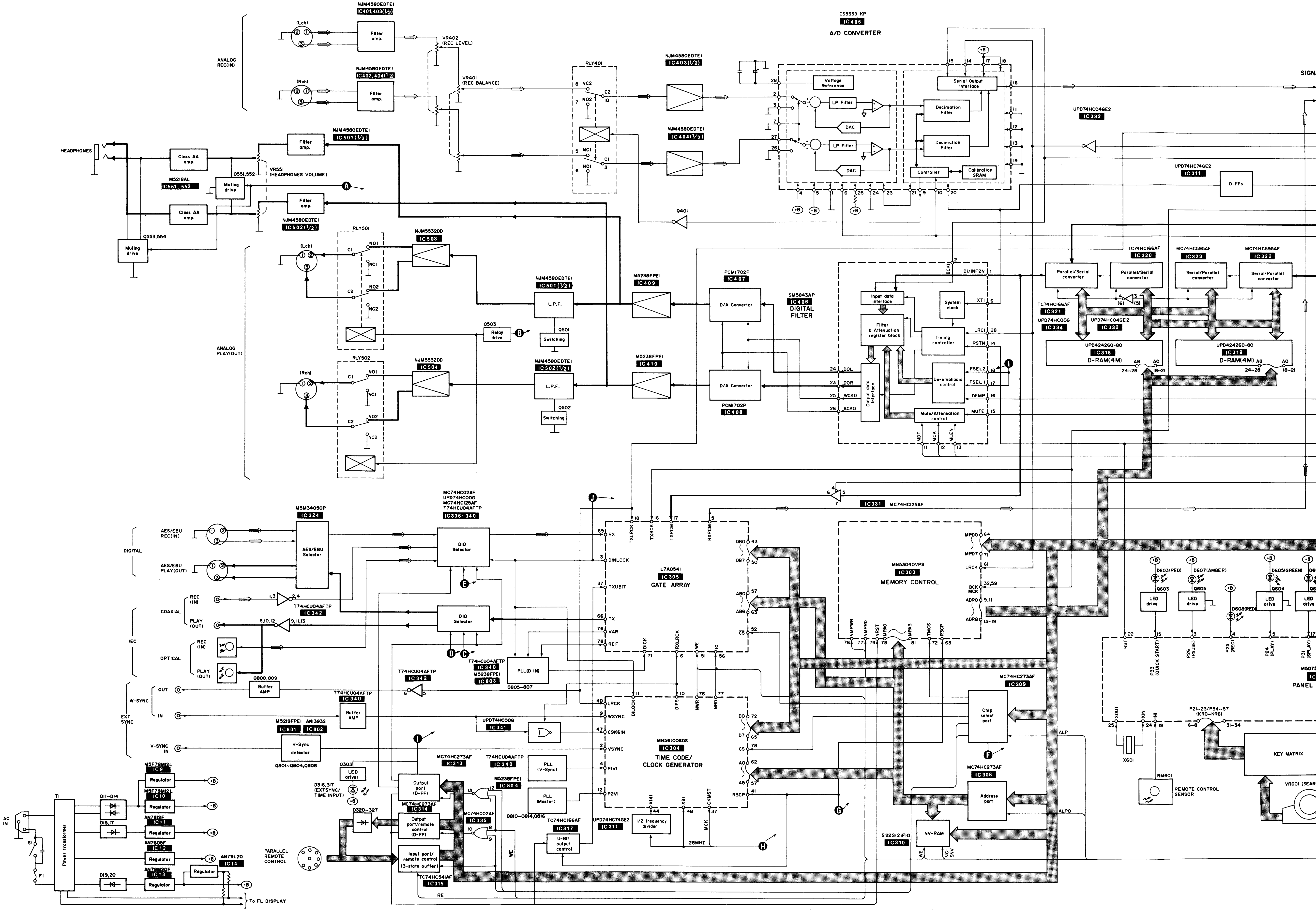
Ⓒ

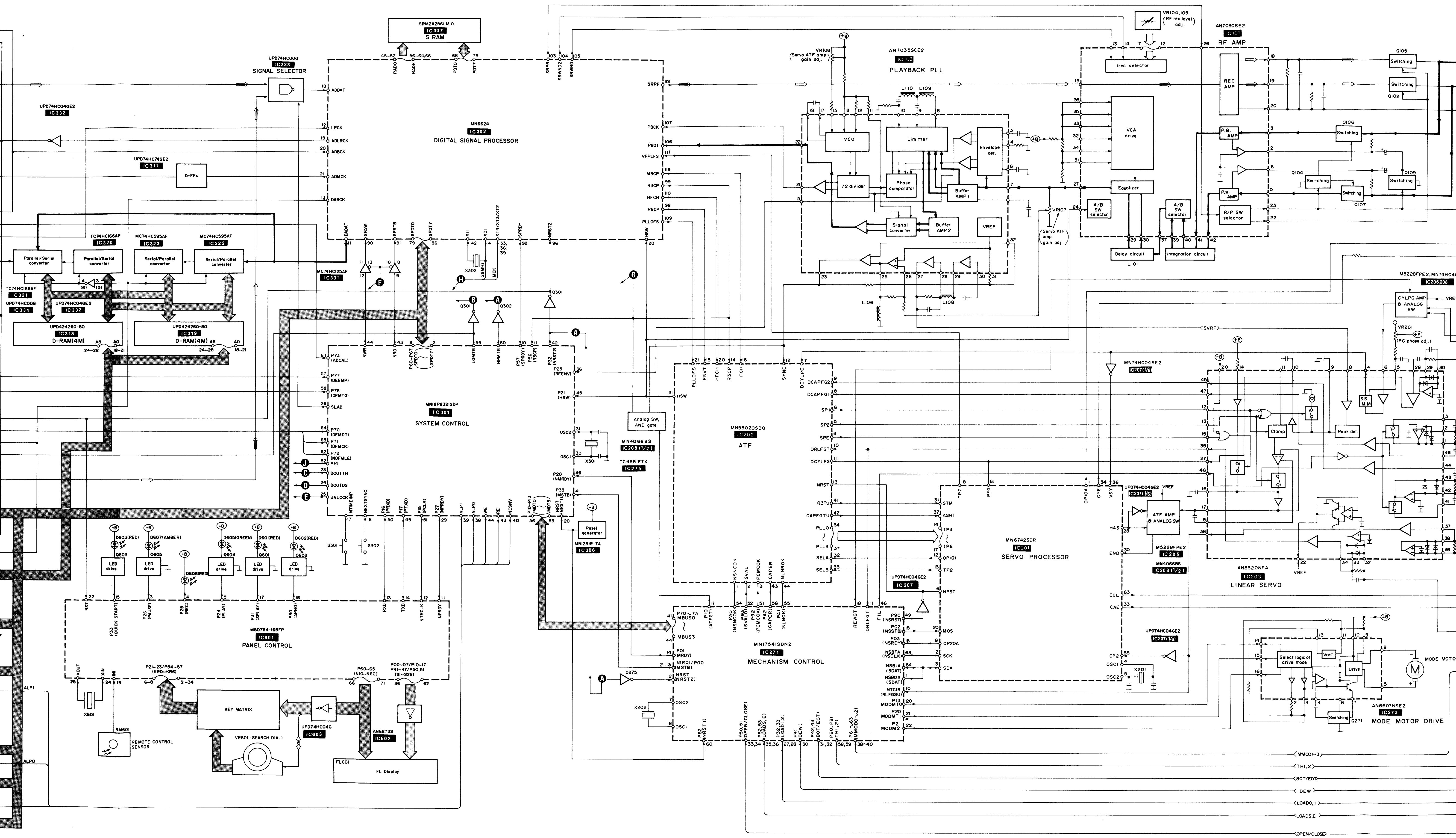


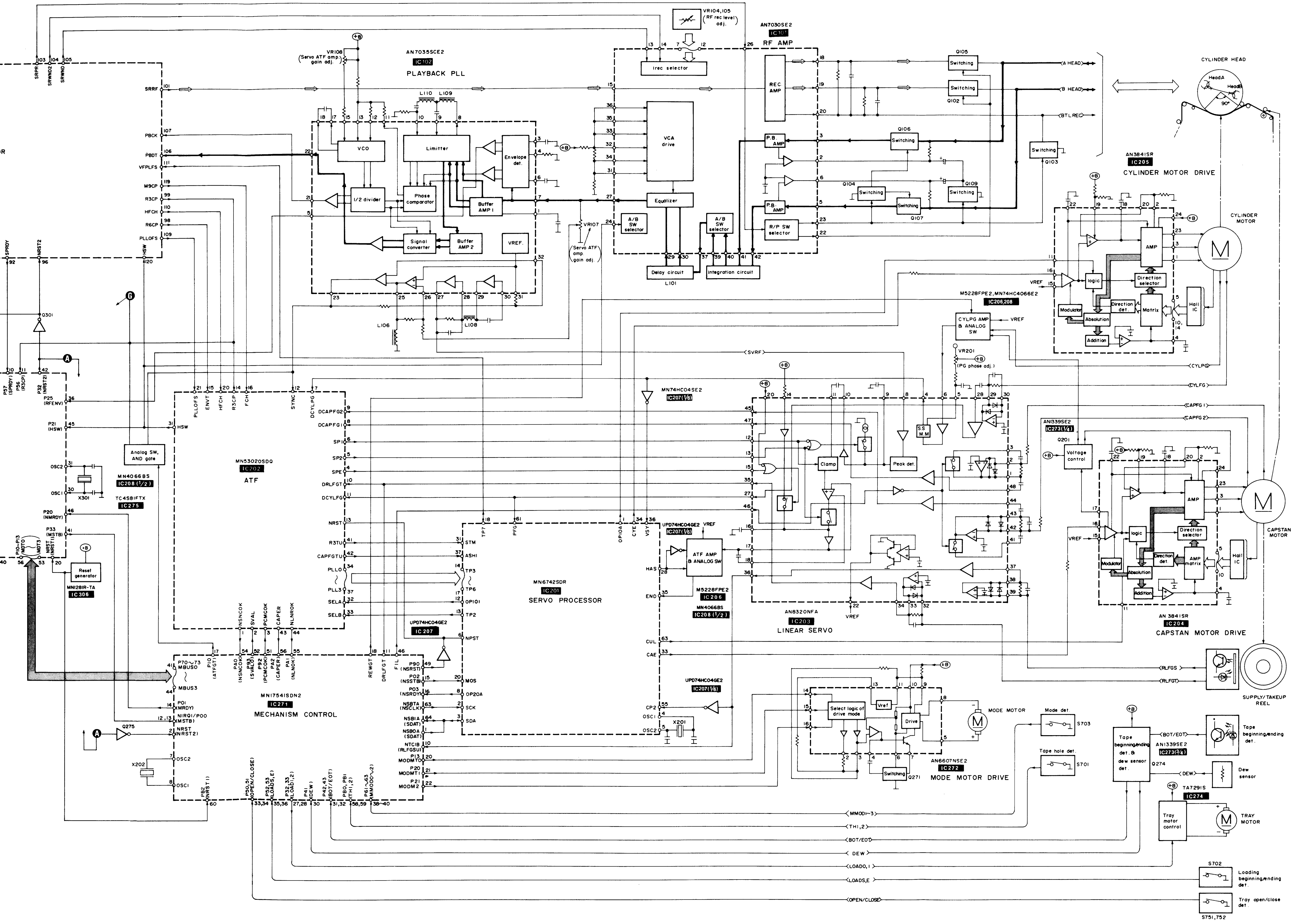


7. Play the standard test tape (RD-ER01), and do "PG Phase adjustment" and "ATF gain adjustment" again.

■ BLOCK DIAGRAM


ANALOG REC(IN)
(Lch)
(Rch)
NJM4580EDTE1 IC401,403(1/2)
NJM4580EDTE1 IC402,404(1/2)
Filter amp.
VR402 (REC LEVEL)
VR401 (REC BALANCE)
RLY401
NJM4580EDTE1 IC403(1/2)
NJM4580EDTE1 IC404(1/2)
CS5339-KP IC405 A/D CONVERTER
Voltage Reference
LP Filter
DAC
Decimation Filter
Serial Output Interface
Controller
Calibration SRAM
Q401
UPD74HC04GE2 IC332
UPD74HC74GE2 IC311
D-FFs
SIGN
HEADPHONES
Class AA amp.
M5218AL IC551, 552
Muting drive
Q551,552
VR551 (HEADPHONES VOLUME)
NJM4580EDTE1 IC501(1/2)
NJM4580EDTE1 IC502(1/2)
Q553,554
Muting drive
ANALOG PLAY(OUT)
RLY501
RLY502
NJM5532DD IC503
NJM5532DD IC504
L.P.F.
Switching
Q501
Q502
Q503
Relay drive
M5238FPE1 IC409
M5238FPE1 IC410
PCM1702P IC407
PCM1702P IC408
D/A Converter
SM5843AP IC406 DIGITAL FILTER
Input data interface
Filter & Attenuation register block
System clock
Timing controller
De-emphasis control
Output data interface
Mute/Attenuation control
TC74HC166AF IC320
M74HC595AF IC323
M74HC595AF IC322
Parallel/Serial converter
Serial/Parallel converter
TC74HC166AF IC321
UPD74HC00G IC334
UPD74HC04GE2 IC332
UPD424260-80 IC318 D-RAM(4M)
UPD424260-80 IC319 D-RAM(4M)
IC331 MC74HC125AF
DIGITAL
AES/EBU REC(IN)
AES/EBU PLAY(OUT)
M5M34050P IC324
AES/EBU Selector
MC74HC02AF UPD74HC00G MC74HC125AF T74HCU04AFTP IC336~340
DIO Selector
COAXIAL
IEC
OPTICAL
REC (IN)
PLAY (OUT)
T74HCU04AFTP IC342
T74HCU04AFTP IC340
M5238FPE1 IC803
PLL(D IN)
Q805~807
L7A0541 IC305 GATE ARRAY
MN53040VPS IC303 MEMORY CONTROL
EXT SYNC
W-SYNC
OUT
IN
V-SYNC IN
Q808,809
Buffer AMP
T74HCU04AFTP IC340
M5219FPE1 IC801
AN1393S IC802
V-Sync detector
Q801~0804,0806
UPD74HC00G IC341
MN56100SDS IC304 TIME CODE/ CLOCK GENERATOR
1/2 frequency divider
28MHZ
MC74HC273AF IC313
T74HCU04AFTP IC340
PLL (V-Sync)
PLL (Master)
M5238FPE1 IC804
Q810~Q814,Q816
TC74HC166AF IC317
U-Bit output control
UPD74HC74GE2 IC311
Q303
LED driver
D316,317 (EXTSYNC/ TIME INPUT)
D320~327
Output port (D-FF)
MC74HC273AF IC314
Output port/remote control (D-FF)
Input port/remote control (3-state buffer)
TC74HC541AF IC315
MC74HC02AF IC335
PARALLEL REMOTE CONTROL
MC74HC273AF IC309
Chip select port
MC74HC273AF IC308
Address port
S22S121F10 IC310
NV-RAM
D603(RED)
D607(AMBER)
D605(GREEN)
D608(RED)
LED drive
Q603
Q605
Q604
P33 (QUICK START)
P26 (PAUSE)
P25 (REC)
P24 (PLAY)
P31 (SPLAY)
PANEL
X601
RM601
REMOTE CONTROL SENSOR
P21~23/P54~57 (KR0~KR6)
KEY MATRIX
VR601 (SEAR
AC IN
T1
Power transformer
S1
F1
D11~D14
D15,17
D19,20
M5F78M12L IC9
M5F79M12L IC10
AN7812F IC11
AN7605F IC12
AN79M20F IC13
AN79L20 IC14
Regulator
To FL DISPLAY


SRM2A256LM10
IC307
S RAM
UPD74HC00G
IC333
SIGNAL SELECTOR
UPD74HC04GE2
IC332
UPD74HC74GE2
IC311
D-FFs
MN6624
IC302
DIGITAL SIGNAL PROCESSOR
TC74HC166AF
IC320
MC74HC595AF
IC323
MC74HC595AF
IC322
Parallel/Serial converter
Serial/Parallel converter
TC74HC166AF
IC321
UPD74HC00G
IC334
UPD74HC04GE2
IC332
UPD424260-80
IC318
D-RAM(4M)
UPD424260-80
IC319
D-RAM(4M)
MC74HC125AF
IC331
X302
28MHz
MN18P83218DP
IC301
SYSTEM CONTROL
Analog SW, AND gate
MN4066BS
IC208(1/2)
TC4S81FTX
IC275
X301
Reset generator
MN1281R-TA
IC305
LED drive
D603(RED)
D607(AMBER)
D608(RED)
D605(GREEN)
D601(RED)
D602(RED)
S301
S302
M50754-165FP
IC601
PANEL CONTROL
X601
RM601
REMOTE CONTROL SENSOR
KEY MATRIX
VR601 (SEARCH DIAL)
UPD74HC04G
IC603
AN6873S
IC602
FL601
FL Display
ALP1
ALP0
MN53020SDQ
IC202
ATF
MN17541SDN2
IC271
MECHANISM CONTROL
X202
Q275
AN7035SCE2
IC102
PLAYBACK PLL
VR108
(Servo ATF amp. gain adj.)
L110
L109
VCO
Limitter
Envelope det.
1/2 divider
Phase comparator
Buffer AMP 1
Signal converter
Buffer AMP 2
VREF.
L106
L108
VR107
(Servo ATF amp gain adj.)
VR104,105
(RF rec level adj.)
AN7030SE2
IC101
RF AMP
Irec selector
REC AMP
VCA drive
Equalizer
A/B SW selector
Delay circuit
L101
Integration circuit
P.B AMP
R/P SW selector
Switching
Q105
Q102
Q106
Q104
Q107
Q109
M5228FPE2,MN74HC04
IC206,208
CYLPG AMP & ANALOG SW
VR201
(PG phase adj.)
SVRF
MN74HC04SE2
IC207(1/6)
S.S M.M
Peak det.
Clamp
UPD74HC04GE2
IC207(1/6)
VREF
ATF AMP & ANALOG SW
M5228FPE2
IC206
MN4066BS
IC208(1/2)
AN8320NFA
IC203
LINEAR SERVO
MN6742SDR
IC201
SERVO PROCESSOR
UPD74HC04GE2
IC207
X201
UPD74HC04GE2
IC207(1/6)
Select logic of drive mode
Vref
Drive
MODE MOTOR
Q271
AN6607NSE2
IC272
MODE MOTOR DRIVE
MMOD1~3
THI1,2
BOT/EOT
DEW
LOAD0,1
LOADS,E
OPEN/CLOSE


AN7035SCE2
IC102
PLAYBACK PLL
AN7030SE2
IC101
RF AMP
VR104,105 (RF rec level adj.)
VR108 (Servo ATF amp gain adj.)
VR107 (Servo ATF amp gain adj.)
VCO
Limitter
Envelope det.
1/2 divider
Phase comparator
Buffer AMP 1
Buffer AMP 2
Signal converter
VREF.
Irec selector
REC AMP
VCA drive
Equalizer
A/B SW selector
P.B AMP
R/P SW selector
Delay circuit
Integration circuit
L101
L106
L108
L109
L110
Switching
Q101
Q102
Q103
Q104
Q105
Q106
Q107
Q109
A HEAD
B HEAD
BTL REC
CYLINDER HEAD
HeadA
HeadB
90°
AN3841SR
IC205
CYLINDER MOTOR DRIVE
CYLINDER MOTOR
AMP
logic
Direction selector
Direction det.
Matrix
Modulator
Absolution
Addition
Hall IC
M5228FPE2,MN74HC4066E2
IC206,208
CYLPG AMP & ANALOG SW
VR201 (PG phase adj.)
MN74HC04SE2
IC207(1/6)
AN8320NFA
IC203
LINEAR SERVO
Clamp
Peak det.
S.S M.M
AN1339SE2
IC273(1/4)
Q201
Voltage control
AN3841SR
IC204
CAPSTAN MOTOR DRIVE
CAPSTAN MOTOR
AMP matrix
SUPPLY/TAKEUP REEL
MN53020SDQ
IC202
ATF
MN4066BS
IC208(1/2)
Analog SW, AND gate
TC4S81FTX
IC275
X301
Q301
MN1281R-TA
IC306
Reset generator
MN6742SDR
IC201
SERVO PROCESSOR
UPD74HC04GE2
IC207
IC207(1/6)
ATF AMP & ANALOG SW
M5228FPE2
IC206
X201
MN1754ISDN2
IC271
MECHANISM CONTROL
Q275
X202
Select logic of drive mode
Vref
Drive
Switching
Q271
AN6607NSE2
IC272
MODE MOTOR DRIVE
MODE MOTOR
Mode det
S703
Tape hole det.
S701
Tape beginning/ending det. & dew sensor det.
AN1339SE2
IC273(3/4)
Q274
Tape beginning/ending det.
Dew sensor
TA7291S
IC274
Tray motor control
TRAY MOTOR
S702
Loading beginning/ending det.
Tray open/close det.
S751,752
MMOD1~3
THI,2
BOT/EOT
DEW
LOAD0,1
LOADS,E
OPEN/CLOSE
SVRF
CYLPG
CYLFG
CAPFG1
CAPFG2
RLFGS
RLFGT

Notes:

- ➡ Playback signal
- ⇨ Recording signal

■ SCHEMATIC DIAGRAM

(Parts list on pages 92~95, 104~107.)

(This schematic diagram may be modified at any time with the development of new technology.)

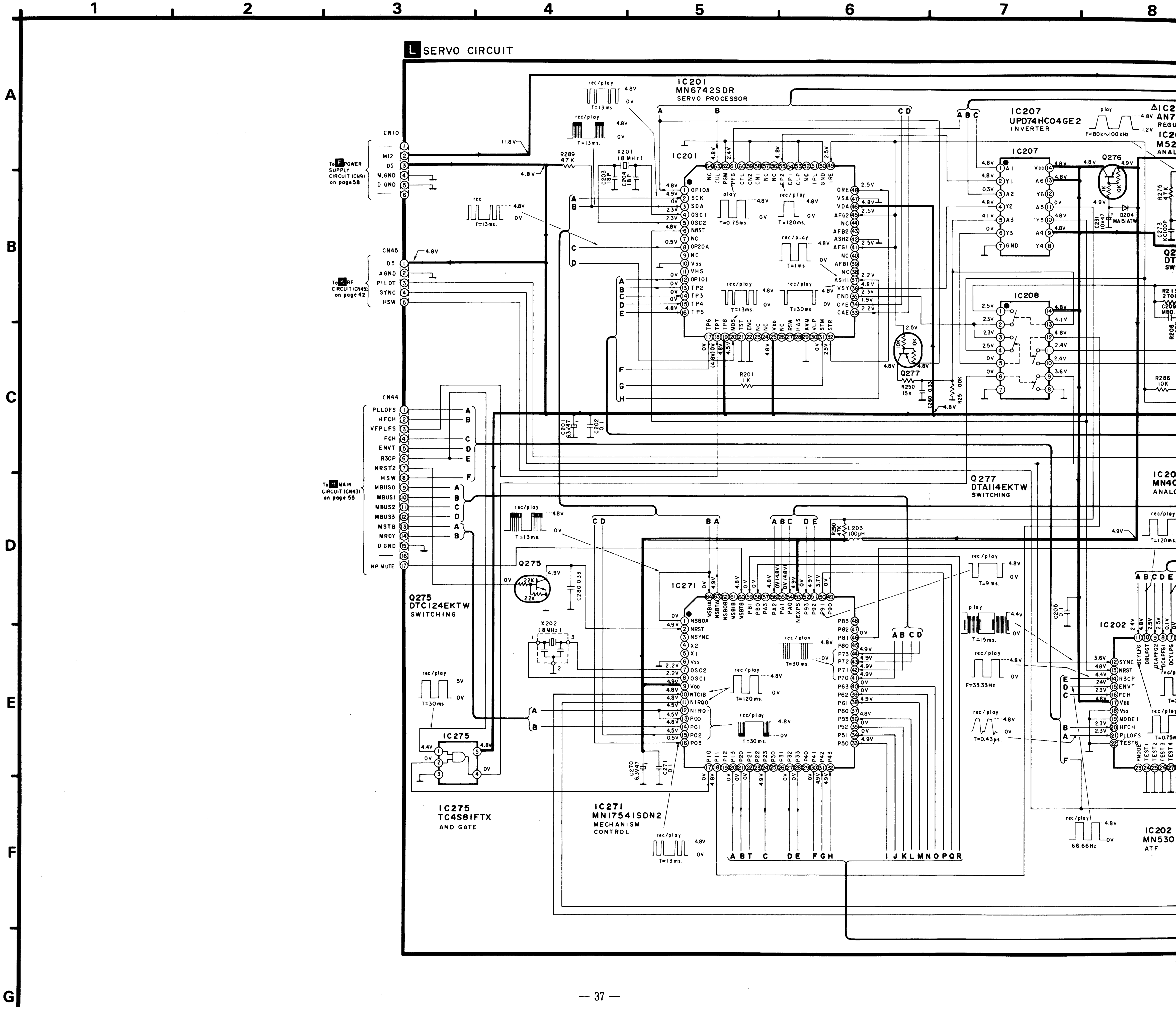
Note 1:

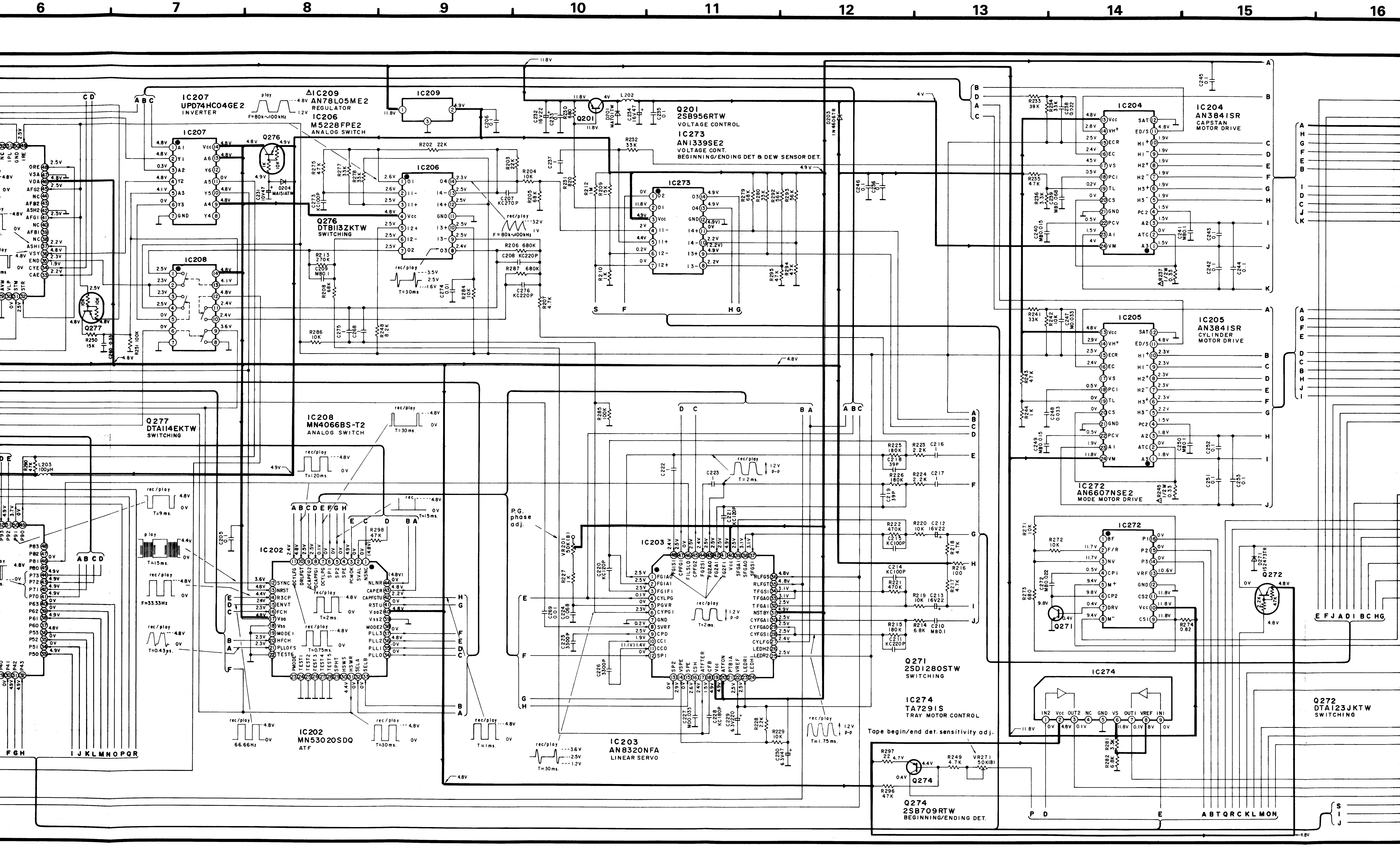
- **S301** : TIME INPUT switch.
- **S302** : EXT SYNC switch.

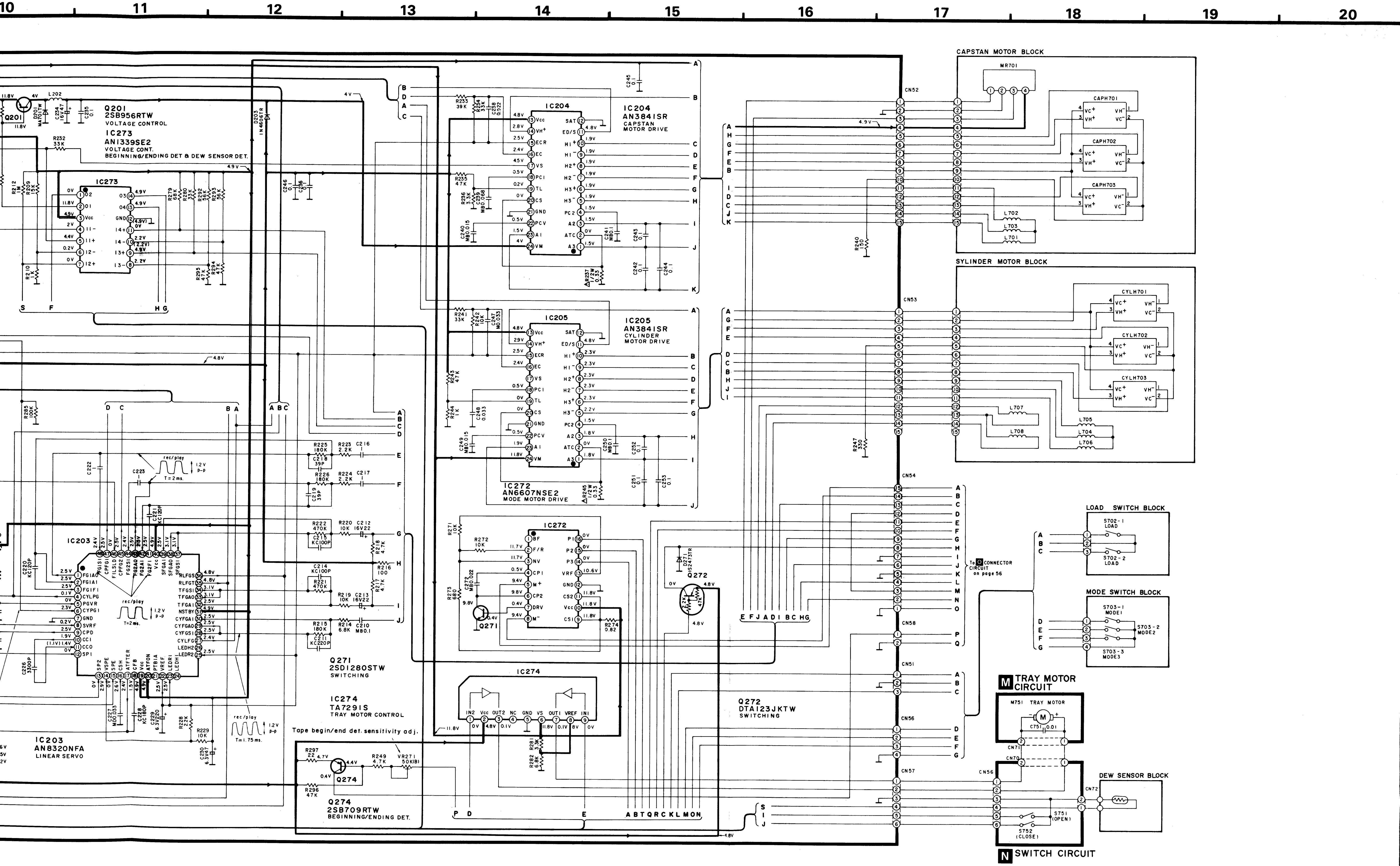
- **S751** : Cassette tray open detection switch.
- **S752** : Cassette tray close detection switch.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  ( ).........Voltage values at recording mode.
  For measurement us EVM.
- Important safety notice
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- (▬▬▬) indicates +B (bias).
- (▬ ▬ ▬) indicates −B (bias).
- (⇛) indicates the flow of the playback signal.
- (⇨) indicates the flow of the recording signal.

∗Caution!

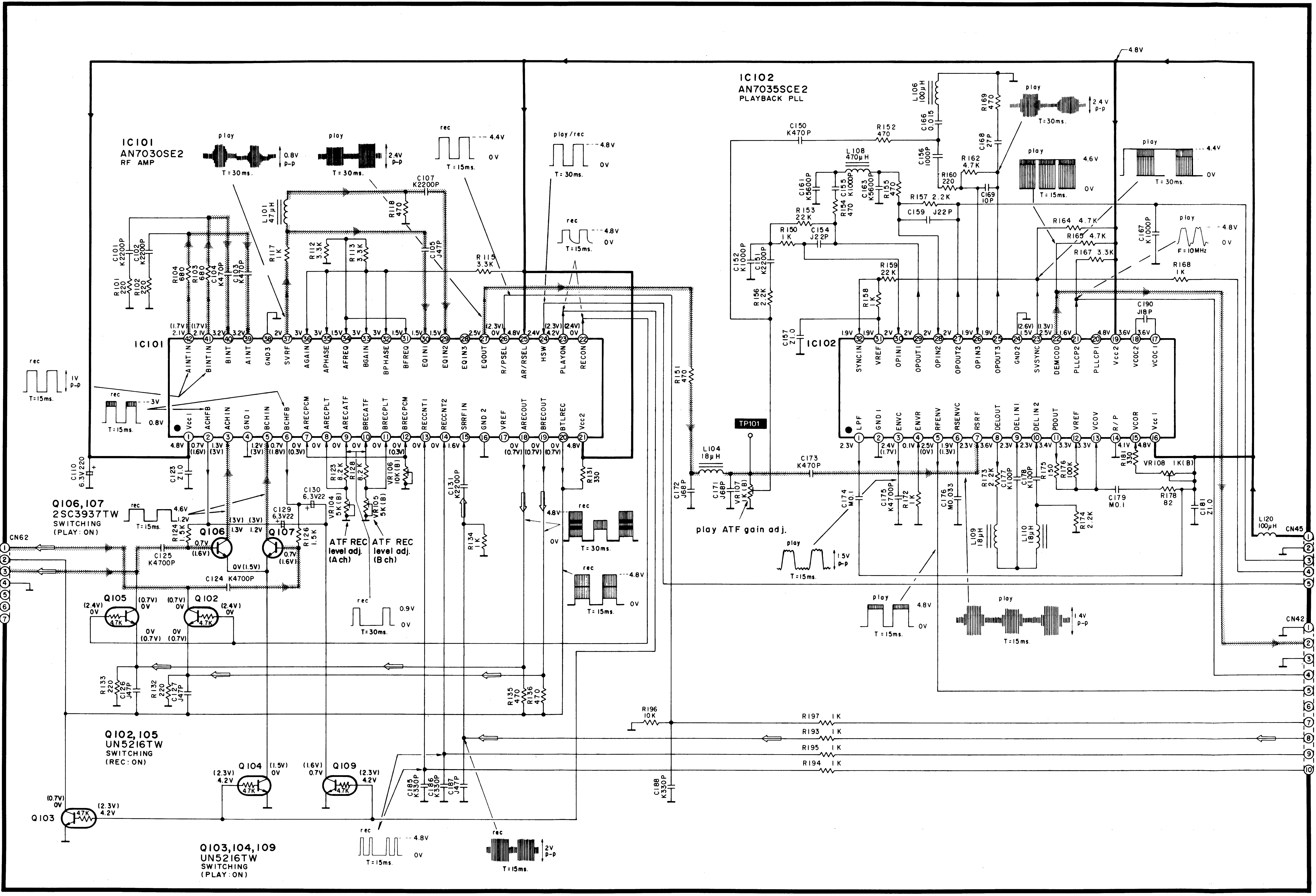
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
∗Cover the parts boxes made of plastics with aluminum foil.
∗Ground the soldering iron.
∗Put a conductive mat on the work table.
∗Do not touch the legs of IC or LSI with fingers directly.

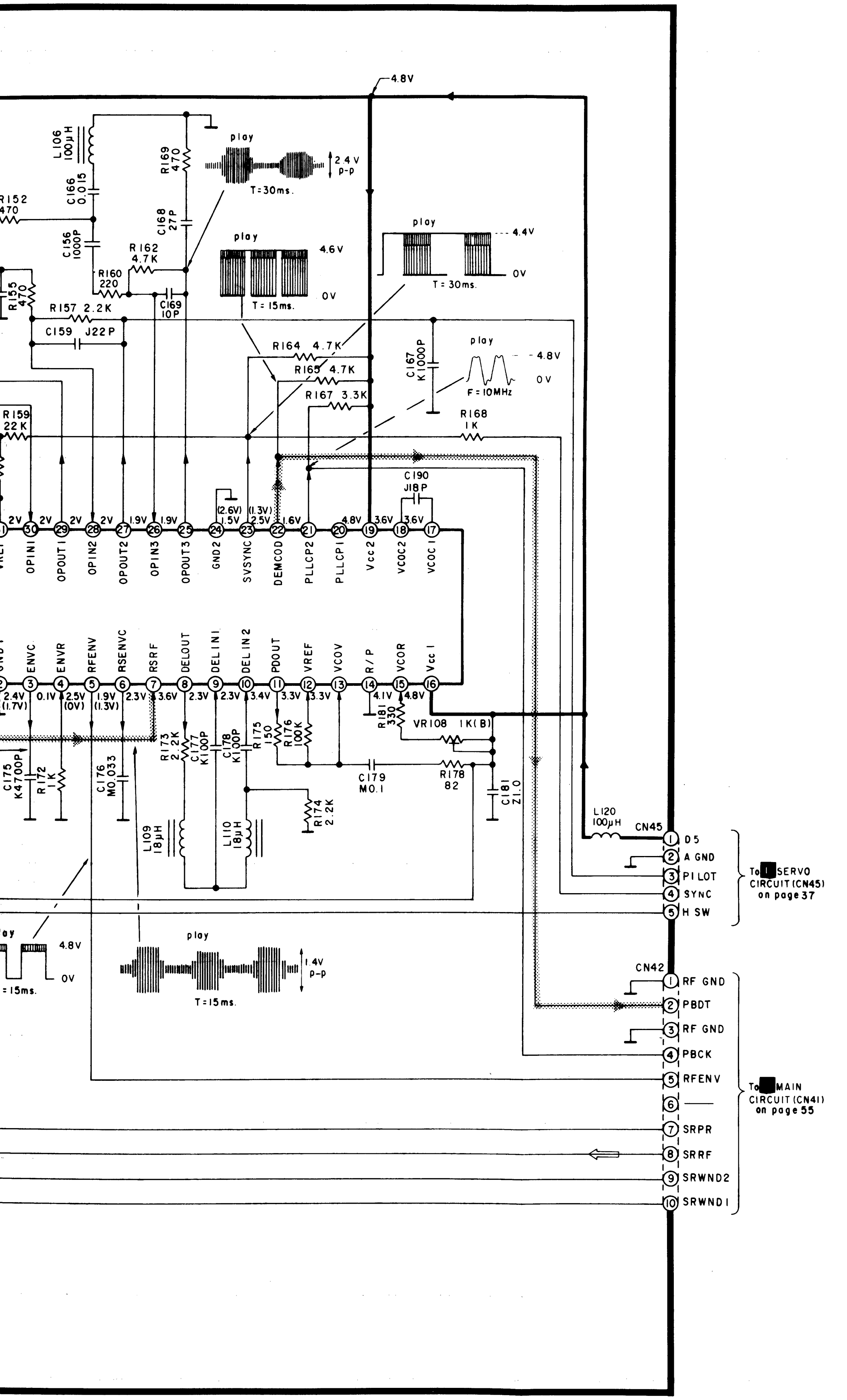

1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
L SERVO CIRCUIT
IC201
MN6742SDR
SERVO PROCESSOR
IC207
UPD74HC04GE2
INVERTER
IC208
Q276
Q277
DTA114EKTW
SWITCHING
IC271
MN17541SDN2
MECHANISM CONTROL
IC275
TC4S81FTX
AND GATE
Q275
DTC124EKTW
SWITCHING
IC202
MN530
ATF
X201 (8 MHz)
X202 (8MHz)
CN10
CN45
CN44
To F POWER SUPPLY CIRCUIT (CN9) on page 58
To K RF CIRCUIT (CN45) on page 42
To H MAIN CIRCUIT (CN43) on page 55
M12
D5
M.GND
D.GND
AGND
PILOT
SYNC
HSW
PLLOFS
HFCH
VFPLFS
FCH
ENVT
R3CP
NRST2
MBUS0
MBUS1
MBUS2
MBUS3
MSTB
MRDY
NP MUTE
rec/play
T=13ms.
T=120ms.
T=30ms
F=33.33Hz
66.66Hz


6
7
8
9
10
11
12
13
14
15
16
IC207
UPD74HC04GE2
INVERTER
△IC209
AN78L05ME2
REGULATOR
IC206
M5228FPE2
ANALOG SWITCH
IC209
Q276
DTB113ZKTW
SWITCHING
IC208
Q277
DTA114EKTW
SWITCHING
IC208
MN4066BS-T2
ANALOG SWITCH
IC202
MN53020SDQ
ATF
Q201
2SB956RTW
VOLTAGE CONTROL
IC273
AN1339SE2
VOLTAGE CONT.
BEGINNING/ENDING DET & DEW SENSOR DET.
IC203
AN8320NFA
LINEAR SERVO
P.G. phase adj.
VR201 50K(B)
IC204
AN3841SR
CAPSTAN
MOTOR DRIVE
IC205
AN3841SR
CYLINDER
MOTOR DRIVE
IC272
AN6607NSE2
MODE MOTOR DRIVE
Q271
2SD1280STW
SWITCHING
IC274
TA7291S
TRAY MOTOR CONTROL
Tape begin/end det. sensitivity adj.
VR271 50K(B)
Q274
2SB709RTW
BEGINNING/ENDING DET.
Q272
DTA123JKTW
SWITCHING
play
F=80k~100kHz
rec/play
T=30ms.
T=20ms.
T=15ms.
T=9ms.
T=2ms.
T=0.75ms.
T=0.43μs.
T=1ms.
T=1.75ms.
F=33.33Hz
66.66Hz

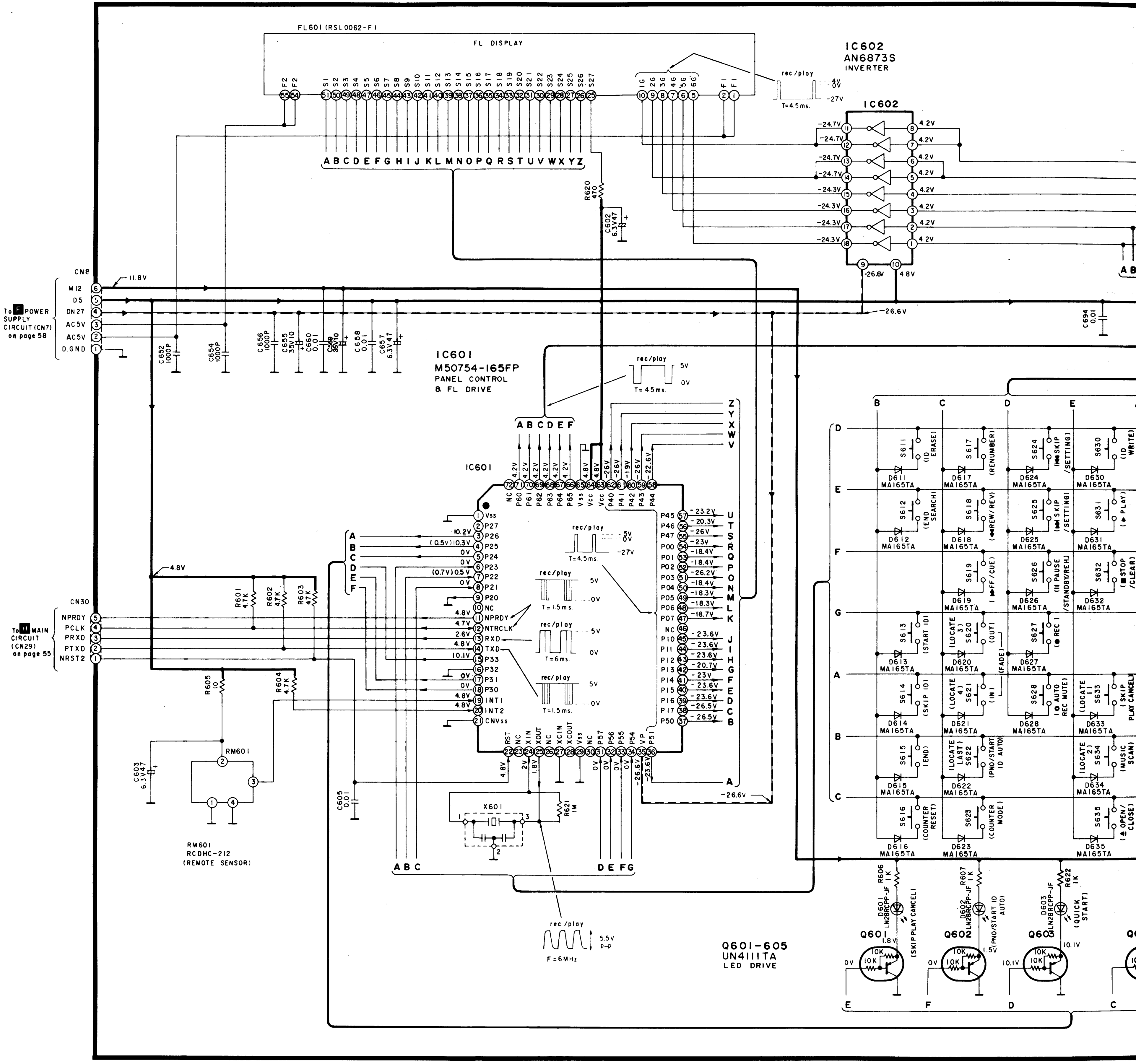

10
11
12
13
14
15
16
17
18
19
20
Q201
2SB956RTW
VOLTAGE CONTROL
IC273
AN1339SE2
VOLTAGE CONT.
BEGINNING/ENDING DET & DEW SENSOR DET.
L202
D201 MA4075W
C234 16V47
C235 0.1
R232 33K
R212
R209 1.8K
R210 1K
R279 68K
R280 33K
R292 33K
R293 56K
R295 47K
R294 47K
D203 1N4606TR
IC204
AN3841SR
CAPSTAN MOTOR DRIVE
R233 39K
R234 33K
C238 0.022
C245 0.1
R235 4.7K
R236 3.3K
C239 MB0.068
C240 MB0.015
C241 MB0.1
C243 0.1
C242 0.1
C244 0.1
R237 1/2W 0.33
C246 0.1
C236 0.1
IC205
AN3841SR
CYLINDER MOTOR DRIVE
R241 33K
R242 10K
C247 MO.033
R243 47K
R244 1K
C248 0.033
C249 MB0.015
C250 MB0.1
C252 0.1
C251 0.1
C253 0.1
R245 1/2W 0.33
IC272
AN6607NSE2
MODE MOTOR DRIVE
Vcc
VH+
ECR
EC
VS
PCI
TL
CS
GND
PCV
A1
VM
SAT
ED/S
H1+
H1-
H2+
H2-
H3+
H3-
PC2
A2
ATC
A3
IC203
AN8320NFA
LINEAR SERVO
rec/play
T=2ms.
1.2V p-p
T=1.75ms.
R225 180K
R223 2.2K
C216 1
C218 39P
R226 180K
R224 2.2K
C217 1
C219 39P
R222 470K
R220 10K
C212 16V22
C215 KC100P
R218 4.7K
R216 100
C214 KC100P
R221 470K
R219 10K
C213 16V22
R217 4.7K
R215 180K
R214 6.8K
C210 MB0.1
C211 KC220P
C220 KC120P
C222
C223
C221 KC120P
C226 3300P
C227 MD0.033
C228 KC180P
C229 6.3V220
R228 22K
R229 10K
C230 6.3V47
R285 100K
FG1S1
FG1A1
FG1F1
CYLPG
CYPG1
PGVR
GND
SVRF
CPD
CC1
CCO
SP1
RLFGS
RLFGT
TFGS1
TFGAO
TFGA1
NSTBY
CYFGA1
CYFGAO
CYFGS1
CYLFG
LEDH2
LEDR2
Q271
2SD1280STW
SWITCHING
IC274
TA7291S
TRAY MOTOR CONTROL
IC272
R271 10K
R272 10K
C272 MB0.022
R273 680
R274 0.82
BF
F/R
NV
CP1
M+
CP2
DRV
M-
P1
P2
P3
VRF
CS2
CS1
Q272
DTA123JKTW
SWITCHING
D271 MA4039
Tape begin/end det. sensitivity adj.
R297 22
R249 4.7K
VR271 50K(B)
R296 47K
Q274
2SB709RTW
BEGINNING/ENDING DET.
IN2
OUT2
NC
GND
VS
OUT1
VREF
IN1
R281 3.3K
R282 6.8K
R240 150
R247 330
CN52
CN53
CN54
CN58
CN51
CN56
CN57
CAPSTAN MOTOR BLOCK
MR701
CAPH701
CAPH702
CAPH703
L702
L703
L701
SYLINDER MOTOR BLOCK
CYLH701
CYLH702
CYLH703
L707
L708
L705
L704
L706
VC+
VH+
VH-
VC-
LOAD SWITCH BLOCK
S702-1 LOAD
S702-2 LOAD
To O CONNECTOR CIRCUIT on page 56
MODE SWITCH BLOCK
S703-1 MODE1
S703-2 MODE2
S703-3 MODE3
M TRAY MOTOR CIRCUIT
M751 TRAY MOTOR
C751 0.01
CN71
CN70
CN56
DEW SENSOR BLOCK
CN72
S751 (OPEN)
S752 (CLOSE)
N SWITCH CIRCUIT
EFJADIBCHG
ABTQRCKLMON

K RF CIRCUIT

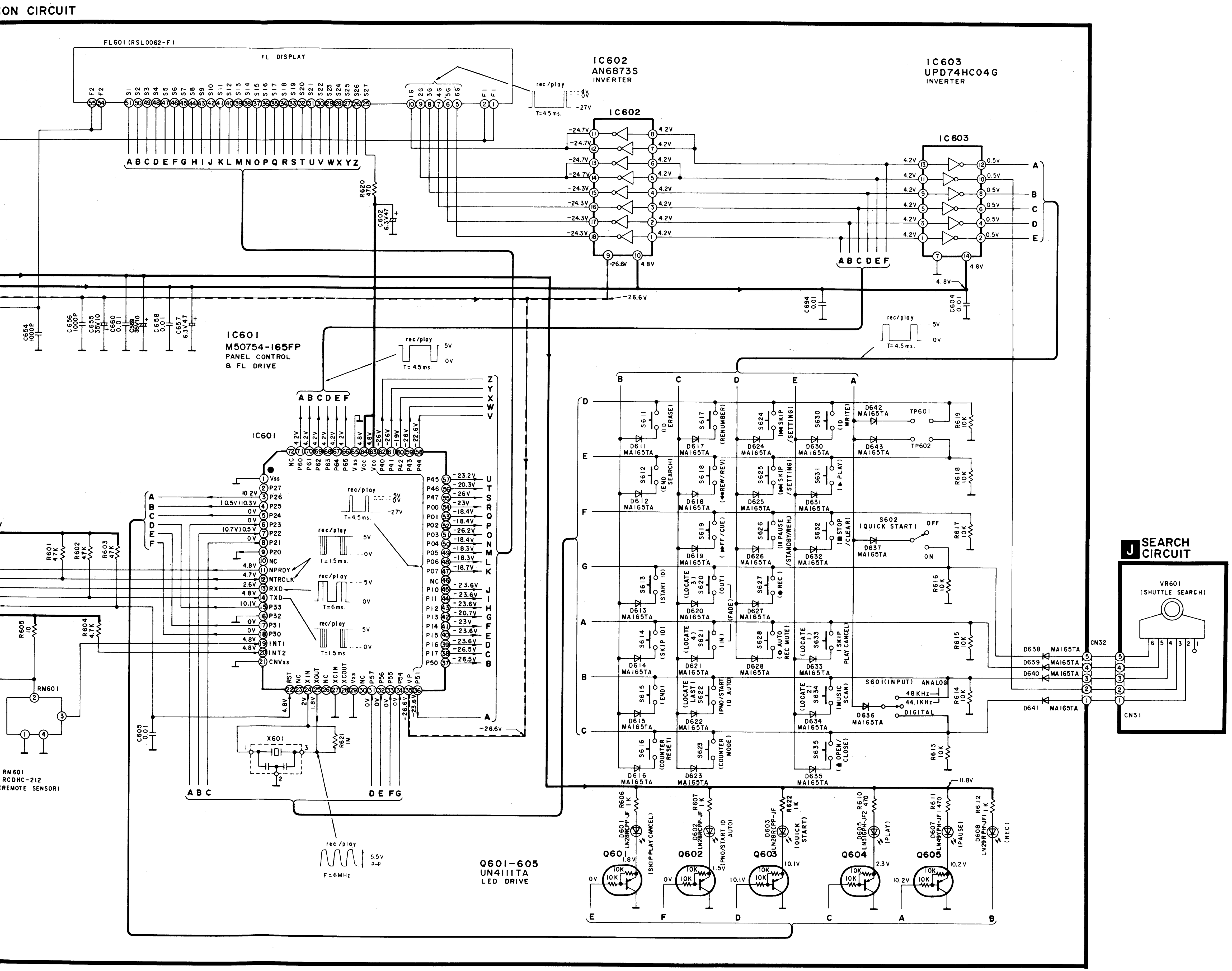

IC101
AN7030SE2
RF AMP
IC102
AN7035SCE2
PLAYBACK PLL
play
rec
play/rec
T=30ms.
T=15ms.
0.8V p-p
2.4V p-p
4.4V
4.8V
0V
C107 K2200P
L101 47μH
R118 470
R117 1K
R112 3.3K
R113 3.3K
C105 J47P
R115 3.3K
C101 K2200P
C102 K2200P
R101 220
R102 220
R104 680
R103 680
C104 K470P
C103 K470P
AINTIN
BINTIN
BINT
AINT
GND3
SVRF
AGAIN
APHASE
AFREQ
BGAIN
BPHASE
BFREQ
EQIN1
EQIN2
EQIN3
EQOUT
R/PSEL
AR/RSEL
HSW
PLAYON
RECON
Vcc1
ACHFB
ACHIN
GND1
BCHIN
BCHFB
ARECPCM
ARECPLT
ARECATF
BRECATF
BRECPLT
BRECPCM
RECCNT1
RECCNT2
SRRFIN
GND2
VREF
ARECOUT
BRECOUT
BTLREC
Vcc2
C110 6.3V220
C123 Z1.0
Q106,107
2SC3937TW
SWITCHING
(PLAY: ON)
Q106
Q107
R124 1.5K
R126 1.5K
C125 K4700P
C124 K4700P
C129 6.3V22
C130 6.3V22
R123 8.2K
R128 8.2K
VR106 10K(B)
VR104 5K(B)
VR105 5K(B)
ATF REC level adj. (A ch)
ATF REC level adj. (B ch)
C131 K2200P
R134 1K
R131 330
R151 470
B. HEAD
A. HEAD
CN62
Q105
Q102
R133 220
C126 J47P
R132 220
C127 J47P
R135 470
R136 470
Q102,105
UN5216TW
SWITCHING
(REC: ON)
Q104
Q109
Q103
Q103,104,109
UN5216TW
SWITCHING
(PLAY: ON)
C185 K330P
C186 K330P
C187 J47P
C188 K330P
0.9V
2V p-p
TP101
L104 18μH
C172 J68P
C171 J68P
VR107 1K(B)
play ATF gain adj.
C173 K470P
1.5V p-p
C150 K470P
R152 470
L106 100μH
C166 0.015
C156 1000P
R169 470
C168 27P
R162 4.7K
R160 220
C169 10P
L108 470μH
C161 K5600P
C155 K1000P
C163 K5600P
R154 470
R155 470
R157 2.2K
C159 J22P
R153 22K
R150 1K
C154 J22P
C152 K1000P
C151 K2200P
R156 2.2K
R158 1K
R159 22K
C157 Z1.0
R164 4.7K
R165 4.7K
R167 3.3K
R168 1K
C167 K1000P
F=10MHz
C190 J18P
SYNCIN
VREF
OPIN1
OPOUT1
OPIN2
OPOUT2
OPIN3
OPOUT3
GND2
SVSYNC
DEMCOD
PLLCP2
PLLCP1
Vcc2
VCOC2
VCOC1
LPF
GND1
ENVC
ENVR
RFENV
RSENVC
RSRF
DELOUT
DELIN1
DELIN2
PDOUT
VREF
VCOV
R/P
VCOR
Vcc1
C174 M0.1
C175 K4700P
R172 1K
C176 M0.035
R173 2.2K
C177 K100P
C178 K100P
R175 150
R176 100K
R174 2.2K
L109 18μH
L110 18μH
C179 M0.1
R181 330
VR108 1K(B)
R178 82
C181 Z1.0
L120 100μH
CN45
D5
A GND
PILOT
SYNC
H SW
CN42
RF GND
PBDT
RF GND
PBCK
RFENV
SRPR
SRRF
SRWND2
SRWND1
R196 10K
R197 1K
R193 1K
R195 1K
R194 1K
1.4V p-p
4.6V
F=10MHz


4.8V
L106 100μH
C166 0.015
R152 470
C156 1000P
R169 470
C168 27P
R162 4.7K
R160 220
C169 10P
R155 470
R157 2.2K
C159 J22P
play
2.4V p-p
T=30ms.
4.6V
0V
T=15ms.
4.4V
T=30ms.
R164 4.7K
R165 4.7K
R167 3.3K
C167 K1000P
4.8V
F=10MHz
R168 1K
C190 J18P
R159 22K
OPIN1
OPOUT1
OPIN2
OPOUT2
OPIN3
OPOUT3
GND2
SVSYNC
DEMCOD
PLLCP2
PLLCP1
Vcc2
VCOC2
VCOC1
ENVC
ENVR
RFENV
RSENVC
RSRF
DELOUT
DELIN1
DELIN2
PDOUT
VREF
VCOV
R/P
VCOR
Vcc1
R181 330
VR108 1K(B)
R178 82
C181 Z1.0
C179 M0.1
R173 2.2K
C177 K100P
C178 K100P
R175 150
R176 100K
R174 2.2K
C175 K4700P
R172 1K
C176 M0.033
L109 18μH
L110 18μH
L120 100μH
CN45
D5
A GND
PILOT
SYNC
H SW
To SERVO CIRCUIT (CN45) on page 37
CN42
RF GND
PBDT
RF GND
PBCK
RFENV
SRPR
SRRF
SRWND2
SRWND1
To MAIN CIRCUIT (CN41) on page 55
1.4V p-p
T=15ms.

OPERATION CIRCUIT

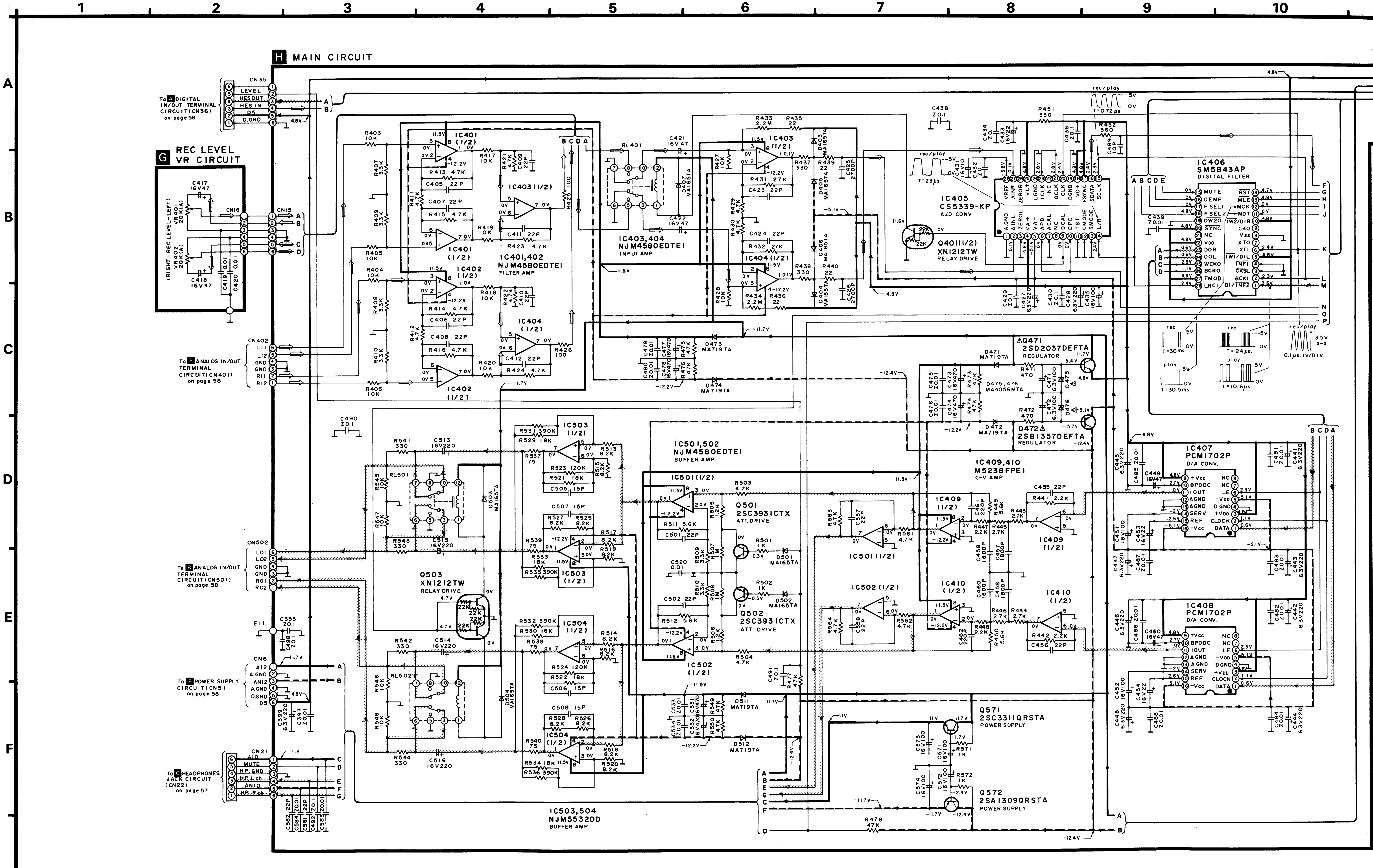

FL601 (RSL0062-F)
FL DISPLAY
IC602
AN6873S
INVERTER
rec/play
T=4.5ms.
R620 470
C602 6.3V47
CN8
M12
D5
DN27
AC5V
AC5V
D.GND
To POWER SUPPLY CIRCUIT (CN7) on page 58
11.8V
-26.6V
C694 0.01
C652 1000P
C654 1000P
C656 1000P
C655 35V10
C660 0.01
C658 0.01
C657 6.3V47
IC601
M50754-165FP
PANEL CONTROL & FL DRIVE
CN30
NPRDY
PCLK
PRXD
PTXD
NRST2
To MAIN CIRCUIT (CN29) on page 55
R601 47K
R602 47K
R603 47K
R605 10
R604 4.7K
RM601
RM601 RCDHC-212 (REMOTE SENSOR)
C603 6.3V47
C605 0.01
X601
R621 1M
rec/play 5.5V p-p F=6MHz
Q601-605
UN4111TA
LED DRIVE
S611 (ID ERASE)
S617 (RENUMBER)
S624 (SKIP /SETTING)
S630 (ID WRITE)
S612 (END SEARCH)
S618 (REW/REV)
S625 (SKIP /SETTING)
S631 (PLAY)
S619 (FF/CUE)
S626 (PAUSE /STANDBY/REH.)
S632 (STOP /CLEAR)
S613 (START ID)
S620 (LOCATE 3)
S627 (REC)
S614 (SKIP ID)
S621 (LOCATE 4)
S628 (AUTO REC MUTE)
S633 (LOCATE 1)
S615 (END)
S622 (LOCATE LAST)
S634 (LOCATE 2)
S616 (COUNTER RESET)
S623 (COUNTER MODE)
S635 (OPEN/CLOSE)
D611–D635 MA165TA
(FADE)
(IN)
(OUT)
(PNO/START ID AUTO)
(SKIP PLAY CANCEL)
(MUSIC SCAN)
D601 LN28RCPP-JF (SKIP PLAY CANCEL)
D602 LN28RCPP-JF (PNO/START ID AUTO)
D603 LN28RCPP-JF (QUICK START)
R606 1K
R607 1K
R622 1K
Q601
Q602
Q603
10K

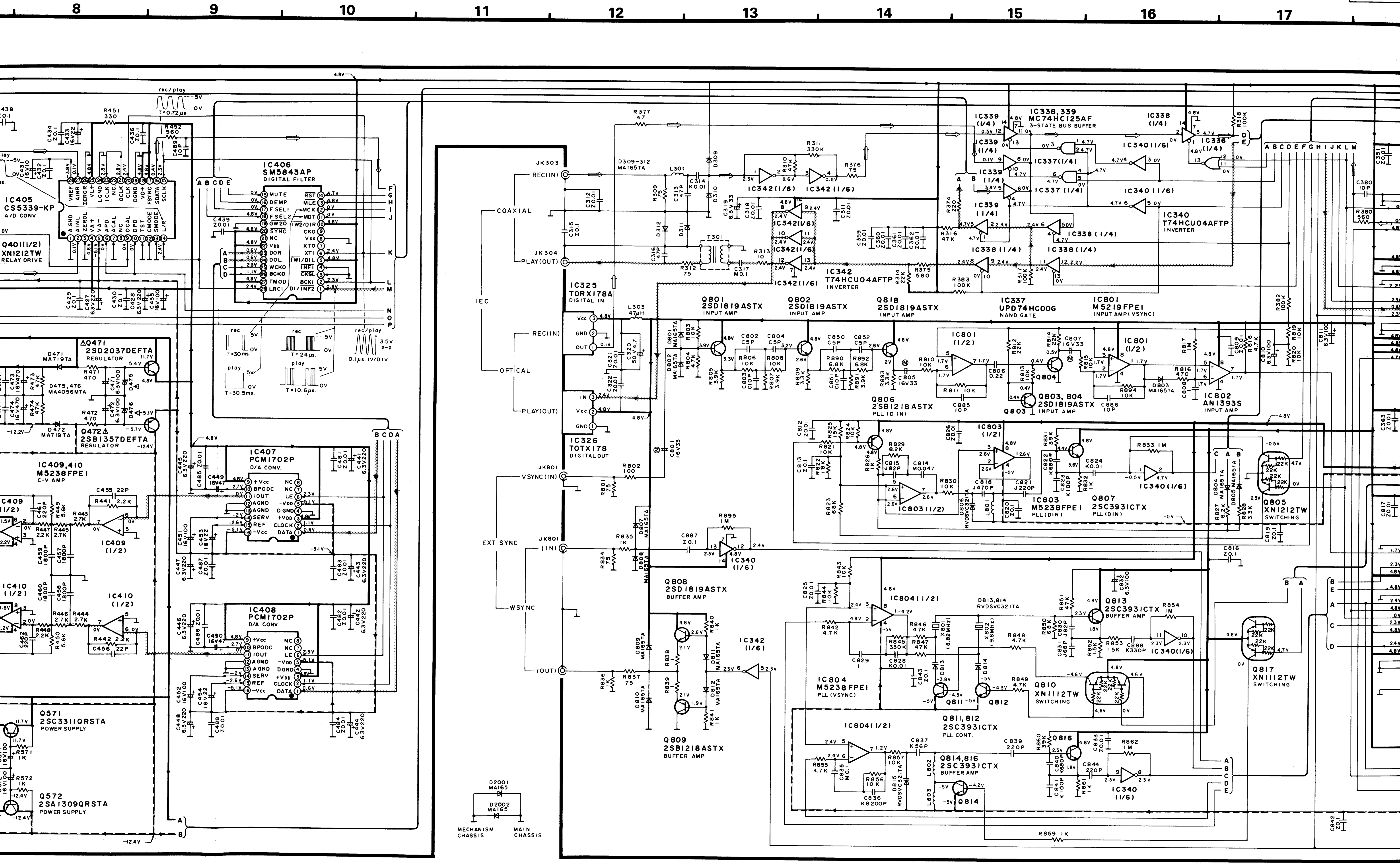
ION CIRCUIT


FL601 (RSL0062-F)
FL DISPLAY
IC602
AN6873S
INVERTER
IC603
UPD74HC04G
INVERTER
IC601
M50754-165FP
PANEL CONTROL
& FL DRIVE
rec/play
T=4.5ms.
T=1.5ms.
T=6ms
F=6MHz
X601
RM601
RCDHC-212
(REMOTE SENSOR)
R620 470
C602 6.3V47
C654 1000P
C656 1000P
C655 35V10
C660 0.01
C659 35V10
C658 0.01
C657 6.3V47
C694 0.01
C604 0.01
C605 0.01
R601 47K
R602 47K
R603 47K
R604 47K
R605 10
R621 1M
-26.6V
4.8V
S611 (ID ERASE)
S617 (RENUMBER)
S624 (SKIP /SETTING)
S630 (ID WRITE)
S612 (END SEARCH)
S618 (REW/REV)
S625 (SKIP /SETTING)
S631 (PLAY)
S619 (FF/CUE)
S626 (PAUSE /STANDBY/REH)
S632 (STOP /CLEAR)
S602 (QUICK START)
OFF
ON
S613 (START ID)
S620 (LOCATE 3) (OUT)
(FADE)
S627 (REC)
S614 (SKIP ID)
S621 (LOCATE 4) (IN)
S628 (AUTO REC MUTE)
S633 (LOCATE 1) (SKIP PLAY CANCEL)
S615 (END)
S622 (LOCATE LAST) (PNO/START ID AUTO)
S601 (INPUT)
ANALOG
48KHz
44.1KHz
DIGITAL
S634 (LOCATE 2) (MUSIC SCAN)
S616 (COUNTER RESET)
S623 (COUNTER MODE)
S635 (OPEN/CLOSE)
D611 MA165TA
D642 MA165TA
D643 MA165TA
TP601
TP602
R619 10K
R618 10K
R617 10K
R616 10K
R615 10K
R614 10K
R613 10K
D638 MA165TA
D639 MA165TA
D640 MA165TA
D641 MA165TA
CN32
CN31
J SEARCH CIRCUIT
VR601 (SHUTTLE SEARCH)
-11.8V
R606 1K
R607 1K
R622 1K
R610 470
R611 470
R612 1K
D601 LN28RCPP-JF (SKIP PLAY CANCEL)
D602 (PNO/START ID AUTO)
D603 LN28RCPP-JF (QUICK START)
D605 (PLAY)
D607 LN49YPH-JF1 (PAUSE)
D608 LN29RPH-JF1 (REC)
Q601
Q602
Q603
Q604
Q605
Q601-605
UN4111TA
LED DRIVE

Note 2:

- **S1** : Power switch (POWER).
- **S601** : Input selector switch (INPUT) (▬ DIGITAL/ ■ ANALOG).
- **S602** : Quick start switch (QUICK START).
- **S611** : ID erase switch (ID ERASE).
- **S612** : End search switch (END SEARCH).
- **S613** : Start ID switch (START ID).
- **S614** : Skip ID switch (SKIP ID).
- **S615** : End switch (END).
- **S616** : Counter reset switch (COUNTER RESET).
- **S617** : Renumber switch (RENUMBER).
- **S618** : Rew/rev switch (REW/REV).
- **S619** : FF/cue switch (FF/CUE).
- **S620** : Fade out switch (FADE OUT).
- **S621** : Fade in switch (FADE IN).
- **S622** : PNO/start ID auto switch (PNO/START ID AUTO).
- **S623** : Counter mode switch (COUNTER MODE).
- **S624, 625** : Skip switches (SKIP). [S624 ⏮, S625 ⏭]
- **S626** : Pause switch (PAUSE).
- **S627** : Record switch (REC).
- **S628** : Auto rec mute switch (AUTO REC MUTE).
- **S630** : ID write switch (ID WRITE).
- **S631** : Play switch (PLAY).
- **S632** : Stop switch (STOP).
- **S633** : Skip play cancel switch (SKIP PLAY CANCEL).
- **S634** : Music scan switch (MUSIC SCAN).
- **S635** : Open/close switch (OPEN/CLOSE).
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  ( ).........Voltage values at recording mode.
  For measurement us EVM.
- Important safety notice
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- (━━━━) indicates +B (bias).
- (▬ ▬ ▬ ▬) indicates −B (bias).
- (⇢) indicates the flow of the playback signal.
- (⇒) indicates the flow of the recording signal.


H MAIN CIRCUIT
G REC LEVEL VR CIRCUIT
To A DIGITAL IN/OUT TERMINAL CIRCUIT(CN36) on page 58
CN35
LEVEL
HESOUT
HES IN
D5
D.GND
VR401 20K(A)
VR402 20K(A)
(RIGHT-REC LEVEL-LEFT)
C417 16V47
C418 16V47
CN16
CN15
CN402
To B ANALOG IN/OUT TERMINAL CIRCUIT(CN401) on page 58
IC401 (1/2)
IC402 (1/2)
IC403 (1/2)
IC404 (1/2)
IC401,402 NJM4580EDTE1 FILTER AMP
RL401
IC403,404 NJM4580EDTE1 INPUT AMP
IC405 CS5339-KP A/D CONV
Q401(1/2) XN1212TW RELAY DRIVE
IC406 SM5843AP DIGITAL FILTER
rec/play
T=0.72μs
T=23μs.
T=30ms.
T=24μs.
T=30.5ms.
T=10.6μs.
3.5V p-p
0.1μs. 1V/DIV.
Q471 2SD2037DEFTA REGULATOR
Q472 2SB1357DEFTA REGULATOR
D473 MA719TA
D474 MA719TA
D475,476 MA4056MTA
D471 MA719TA
D472 MA719TA
IC409,410 M5238FPE1 C-V AMP
IC407 PCM1702P D/A CONV.
IC408 PCM1702P D/A CONV.
IC501,502 NJM4580EDTE1 BUFFER AMP
IC501(1/2)
IC502(1/2)
Q501 2SC3931CTX ATT. DRIVE
Q502 2SC3931CTX ATT. DRIVE
D501 MA165TA
D502 MA165TA
CN502
To B ANALOG IN/OUT TERMINAL CIRCUIT(CN501) on page 58
RL501
RL502
Q503 XN1212TW RELAY DRIVE
IC503 (1/2)
IC504 (1/2)
IC503,504 NJM5532DD BUFFER AMP
D503 MA165TA
D504 MA165TA
D511 MA719TA
D512 MA719TA
CN6
To F POWER SUPPLY CIRCUIT(CN5) on page 58
CN21
To C HEADPHONES JACK CIRCUIT (CN22) on page 57
MUTE
HP.GND
HP.Lch
HP.Rch
Q571 2SC3311QRSTA POWER SUPPLY
Q572 2SA1309QRSTA POWER SUPPLY
R478 47K
E11



8
9
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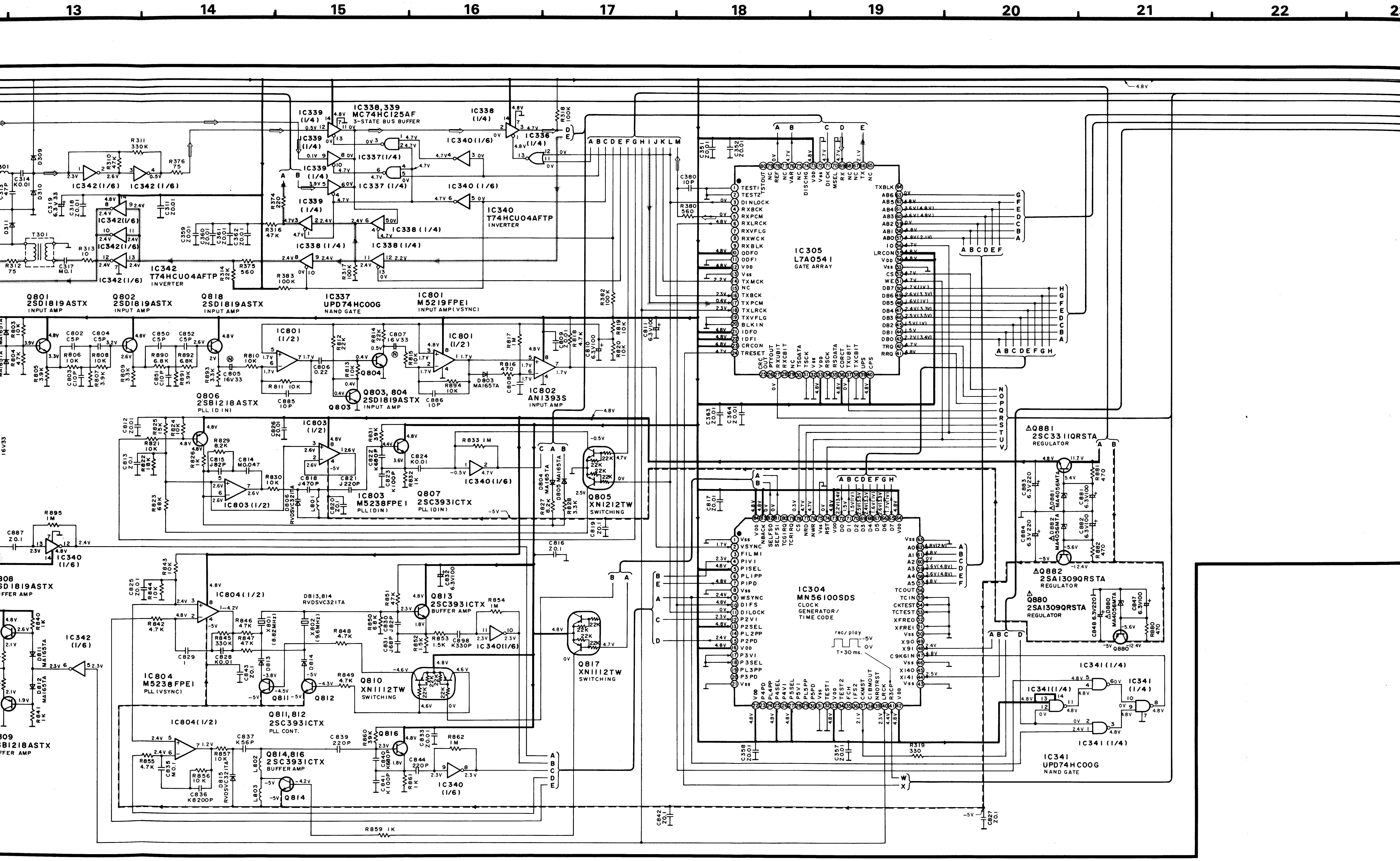
14
15
16
17
IC405
CS5339-KP
A/D CONV
Q401(1/2)
XN1212TW
RELAY DRIVE
IC406
SM5843AP
DIGITAL FILTER
MUTE
DEMP
FSEL1
FSEL2
OW20
SYNC
DOR
DOL
WCKO
BCKO
TMOD
LRCI
RST
MLE
MCK
MDT
IW2/DIR
CKO
XTO
XTI
IWI/DIL
INFI
CKSL
BCKI
DI/INF2
rec/play
T=0.72μs
rec
T=30ms.
play
T=30.5ms.
T=24μs.
T=10.6μs.
3.5V p-p
0.1μs. 1V/DIV.
ΔQ471
2SD2037DEFTA
REGULATOR
D471
MA719TA
D475,476
MA4056MTA
D472
MA719TA
Q472Δ
2SB1357DEFTA
REGULATOR
IC409,410
M5238FPE1
C-V AMP
IC409 (1/2)
IC410 (1/2)
IC407
PCM1702P
D/A CONV.
IC408
PCM1702P
D/A CONV.
Q571
2SC3311QRSTA
POWER SUPPLY
Q572
2SA1309QRSTA
POWER SUPPLY
JK303
REC(IN)
COAXIAL
JK304
PLAY(OUT)
IEC
IC325
TORX178A
DIGITAL IN
REC(IN)
OPTICAL
PLAY(OUT)
IC326
TOTX178
DIGITAL OUT
JK801
VSYNC(IN)
EXT SYNC
JK801
(IN)
WSYNC
(OUT)
D309-312
MA165TA
T301
IC342 (1/6)
IC342
T74HCU04AFTP
INVERTER
IC339 (1/4)
IC338,339
MC74HC125AF
3-STATE BUS BUFFER
IC337 (1/4)
IC338 (1/4)
IC340 (1/6)
IC336 (1/4)
IC340
T74HCU04AFTP
INVERTER
Q801
2SD1819ASTX
INPUT AMP
Q802
2SD1819ASTX
INPUT AMP
Q818
2SD1819ASTX
INPUT AMP
IC337
UPD74HC00G
NAND GATE
IC801
M5219FPE1
INPUT AMP(VSYNC)
IC801 (1/2)
Q806
2SB1218ASTX
PLL (D IN)
Q803, 804
2SD1819ASTX
INPUT AMP
Q804
Q803
IC802
AN1393S
INPUT AMP
IC803 (1/2)
IC803
M5238FPE1
PLL(DIN)
Q807
2SC3931CTX
PLL (DIN)
Q805
XN1212TW
SWITCHING
Q808
2SD1819ASTX
BUFFER AMP
Q809
2SB1218ASTX
BUFFER AMP
IC340 (1/6)
IC342 (1/6)
IC804 (1/2)
IC804
M5238FPE1
PLL (VSYNC)
D813,814
RVDSVC321TA
X801 (8.82MHz)
X802 (9.6MHz)
Q813
2SC3931CTX
BUFFER AMP
Q810
XN1112TW
SWITCHING
Q811
Q812
Q811,812
2SC3931CTX
PLL CONT.
Q817
XN1112TW
SWITCHING
Q814,816
2SC3931CTX
BUFFER AMP
Q816
Q814
D2001
MA165
D2002
MA165
MECHANISM CHASSIS
MAIN CHASSIS


13
14
15
16
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19
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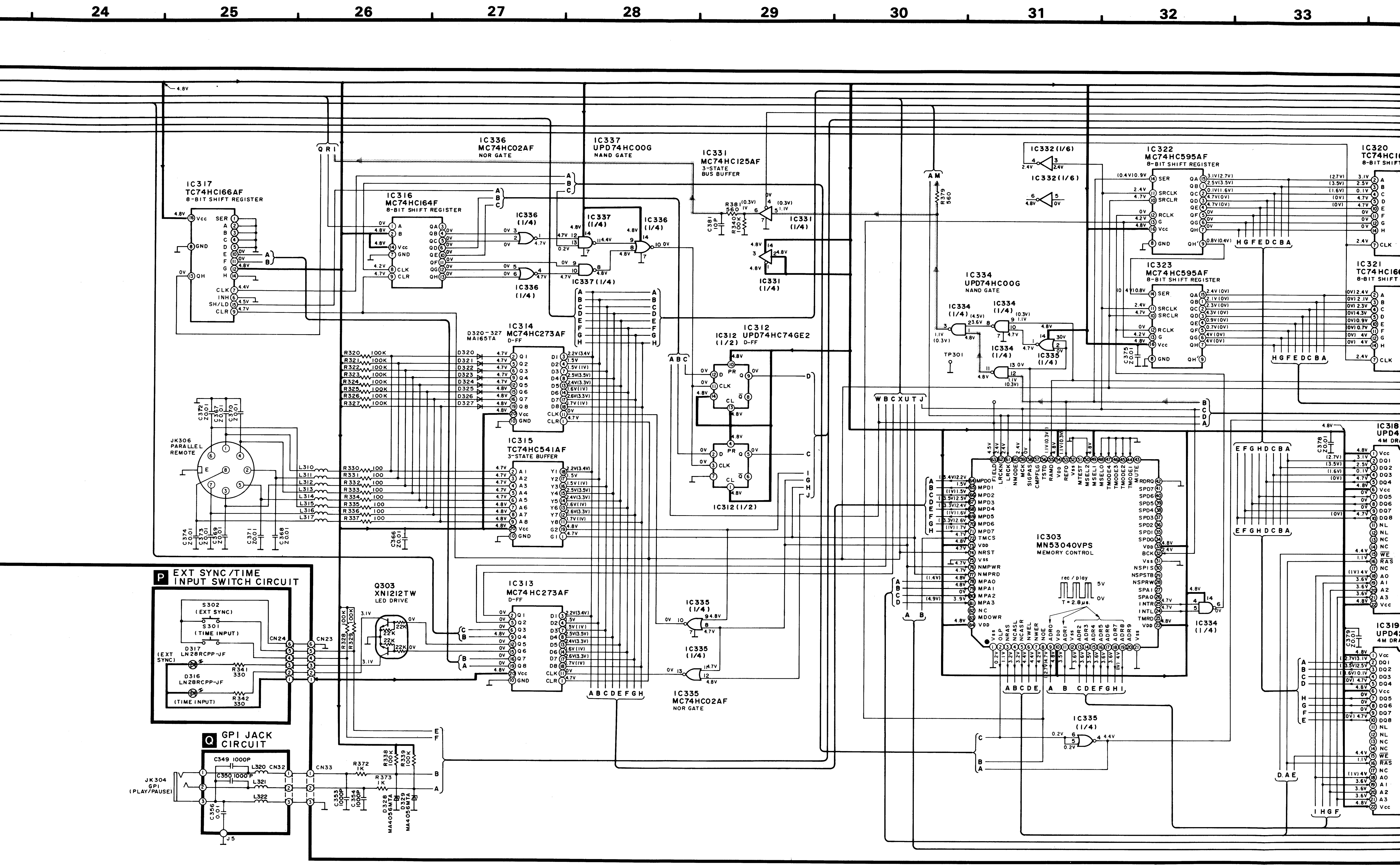
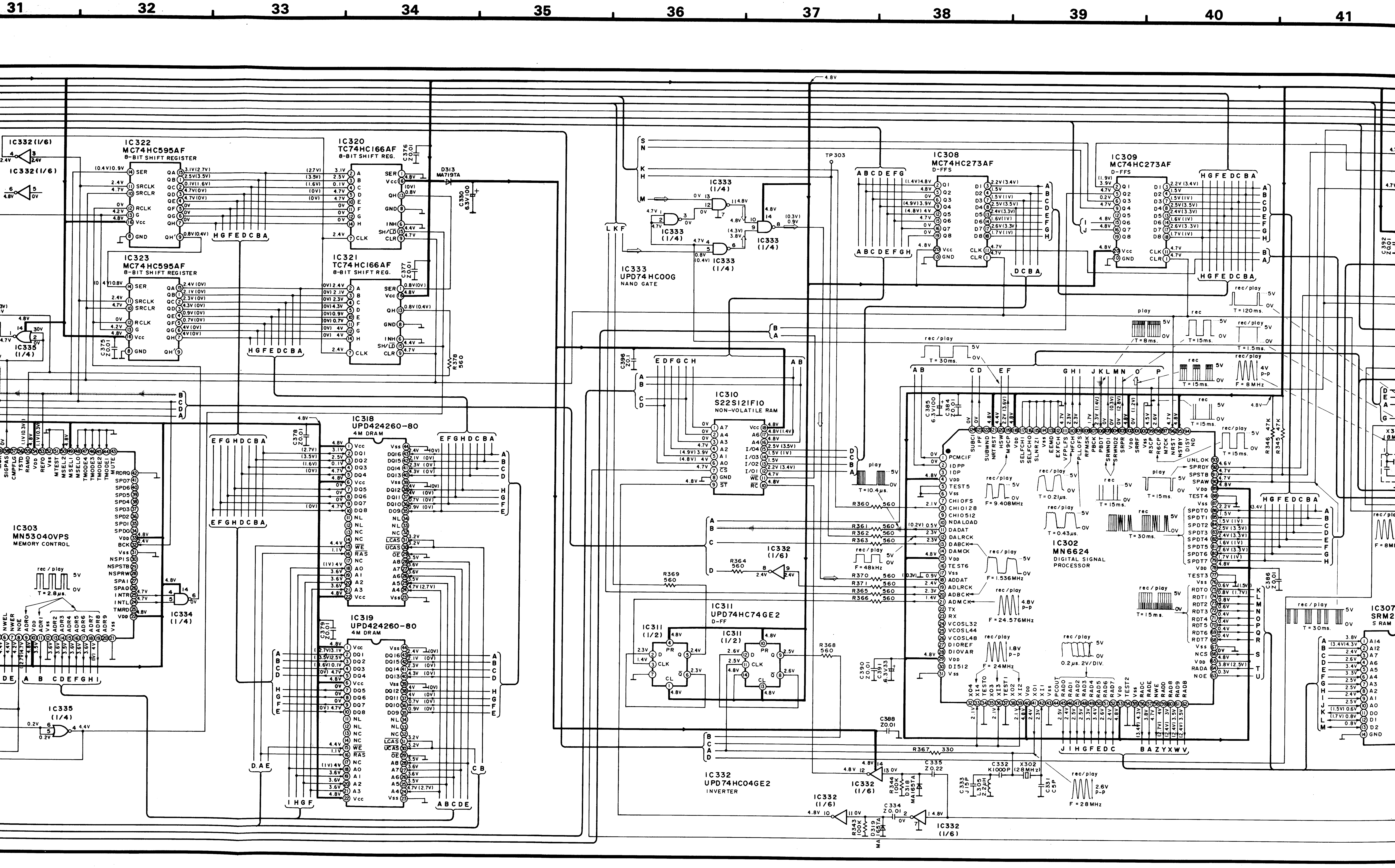
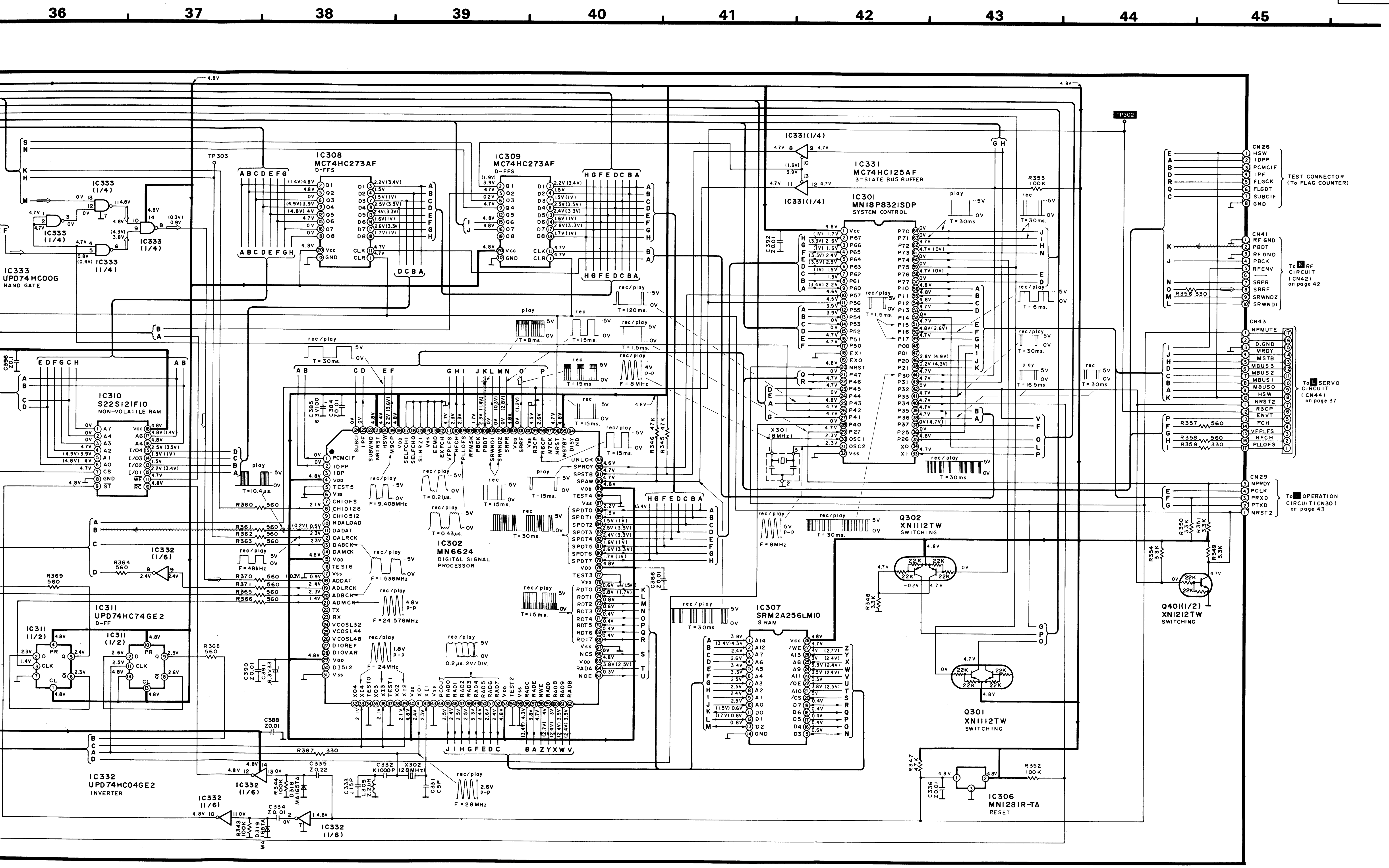
21
22
IC339 (1/4)
IC338,339 MC74HC125AF 3-STATE BUS BUFFER
IC338 (1/4)
IC336 (1/4)
IC340 (1/6)
IC337 (1/4)
IC342 (1/6)
IC340 T74HCU04AFTP INVERTER
IC342 T74HCU04AFTP INVERTER
IC337 UPD74HC00G NAND GATE
IC801 M5219FPEI INPUT AMP (VSYNC)
Q801 2SD1819ASTX INPUT AMP
Q802 2SD1819ASTX INPUT AMP
Q818 2SD1819ASTX INPUT AMP
IC801 (1/2)
Q803, 804 2SD1819ASTX INPUT AMP
IC802 AN1393S INPUT AMP
Q806 2SB1218ASTX PLL (D IN)
IC803 (1/2)
IC803 M5238FPEI PLL (DIN)
Q807 2SC3931CTX PLL (DIN)
Q805 XN1212TW SWITCHING
IC305 L7A0541 GATE ARRAY
IC304 MN56100SDS CLOCK GENERATOR / TIME CODE
rec/play
T=30ms.
ΔQ881 2SC3311QRSTA REGULATOR
ΔQ882 2SA1309QRSTA REGULATOR
ΔQ880 2SA1309QRSTA REGULATOR
IC804 (1/2)
IC804 M5238FPEI PLL (VSYNC)
D813,814 RVDSVC321TA
X801 (8.82MHz)
X802 (9.6MHz)
Q813 2SC3931CTX BUFFER AMP
Q810 XN1112TW SWITCHING
Q811,812 2SC3931CTX PLL CONT.
Q817 XN1112TW SWITCHING
Q814,816 2SC3931CTX BUFFER AMP
Q808 2SD1819ASTX BUFFER AMP
Q809 2SB1218ASTX BUFFER AMP
IC342 (1/6)
IC341 (1/4)
IC341 UPD74HC00G NAND GATE
T301
R859 1K
R319 330

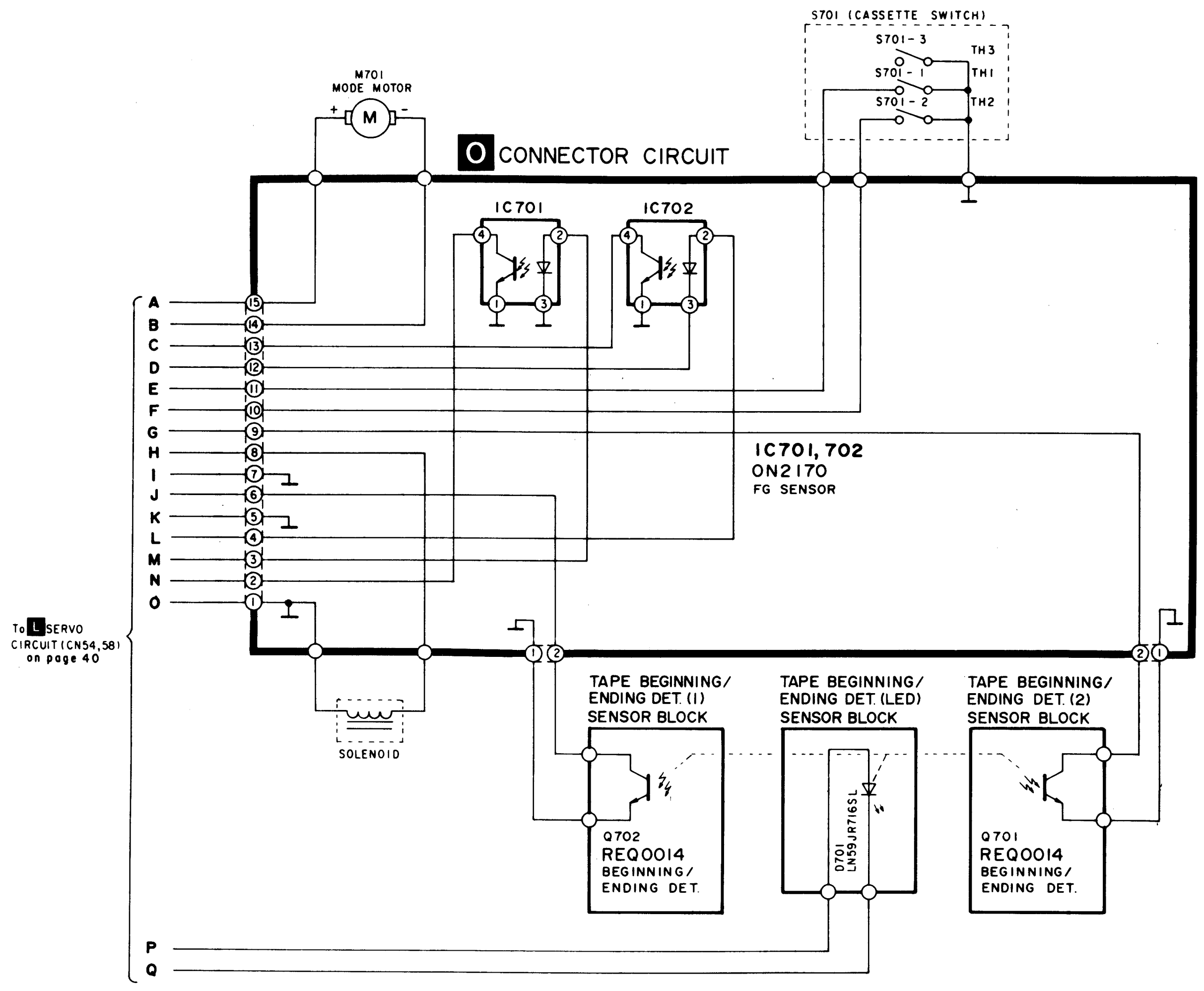

24
25
26
27
28
29
30
31
32
33
IC317 TC74HC166AF 8-BIT SHIFT REGISTER
IC316 MC74HC164F 8-BIT SHIFT REGISTER
IC336 MC74HC02AF NOR GATE
IC337 UPD74HC00G NAND GATE
IC331 MC74HC125AF 3-STATE BUS BUFFER
IC332 (1/6)
IC322 MC74HC595AF 8-BIT SHIFT REGISTER
IC323 MC74HC595AF 8-BIT SHIFT REGISTER
IC320 TC74HC1
IC321 TC74HC16
IC334 UPD74HC00G NAND GATE
IC314 MC74HC273AF D-FF
D320-327 MA165TA
IC315 TC74HC541AF 3-STATE BUFFER
IC312 UPD74HC74GE2 D-FF
IC312 (1/2)
IC303 MN53040VPS MEMORY CONTROL
rec / play
T = 2.8μs.
IC313 MC74HC273AF D-FF
IC335 MC74HC02AF NOR GATE
Q303 XN1212TW LED DRIVE
JK306 PARALLEL REMOTE
IC318 UPD4 4M DRA
IC319 UPD42 4M DRA
TP301
P EXT SYNC/TIME INPUT SWITCH CIRCUIT
S302 (EXT SYNC)
S301 (TIME INPUT)
D317 LN28RCPP-JF
D316 LN28RCPP-JF
(EXT SYNC)
(TIME INPUT)
R341 330
R342 330
CN24
CN23
Q GPI JACK CIRCUIT
JK304 GPI (PLAY/PAUSE)
C349 1000P
C350 1000P
L320
L321
L322
CN32
CN33
C356 0.01
J5
R372 1K
R373 1K
R338 100K
R339 100K
D328 MA4056MTA
D329 MA4056MA
C353 1000P
C354 100P

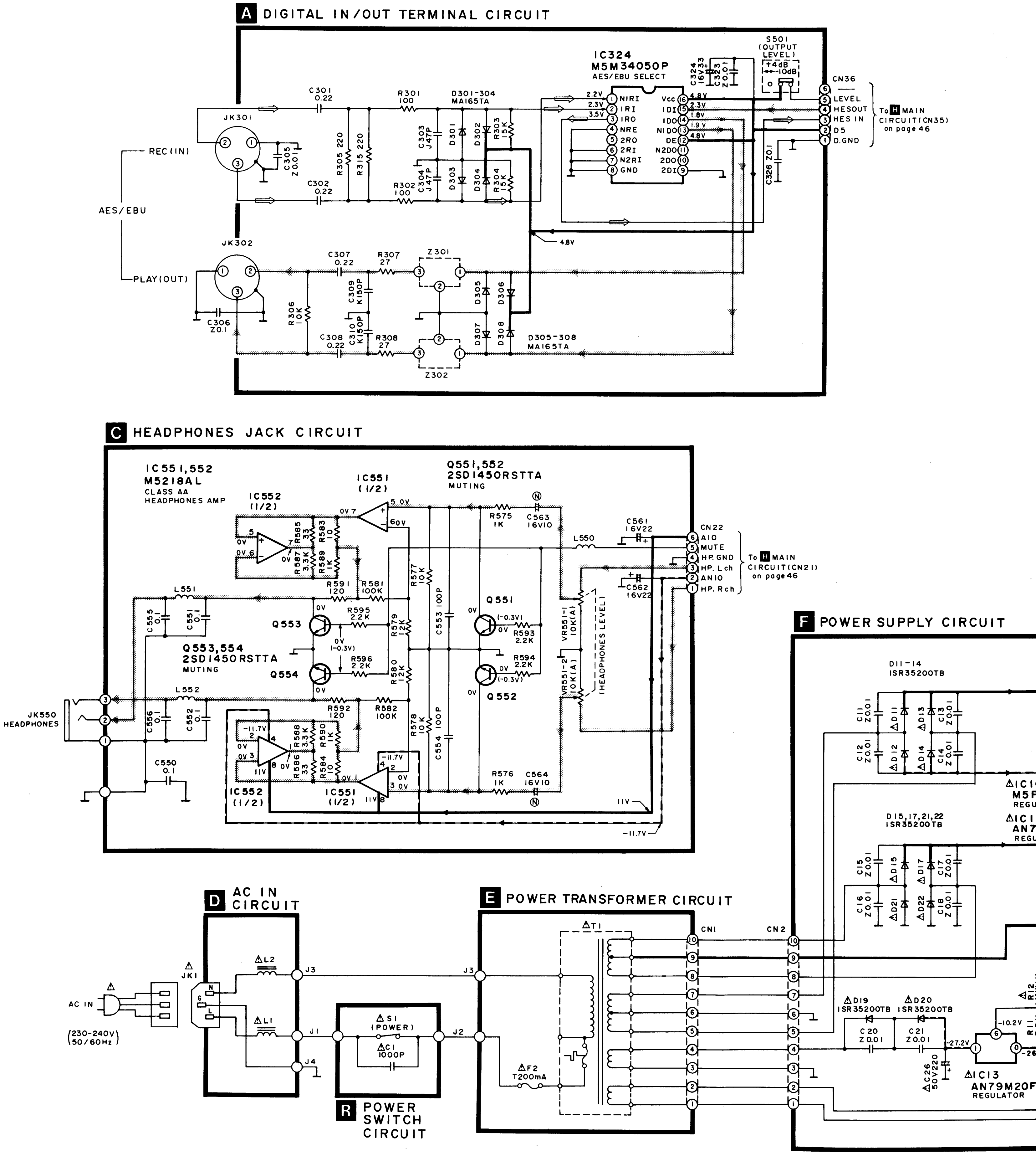

31
32
33
34
35
36
37
38
39
40
41
IC332 (1/6)
IC322
MC74HC595AF
8-BIT SHIFT REGISTER
IC323
MC74HC595AF
8-BIT SHIFT REGISTER
IC320
TC74HC166AF
8-BIT SHIFT REG.
IC321
TC74HC166AF
8-BIT SHIFT REG.
D313
MA719TA
C330
6.3V100
IC335 (1/4)
IC303
MN53040VPS
MEMORY CONTROL
IC334 (1/4)
IC318
UPD424260-80
4M DRAM
IC319
UPD424260-80
4M DRAM
IC333 (1/4)
IC333
UPD74HC00G
NAND GATE
IC310
S22S121F10
NON-VOLATILE RAM
IC311
UPD74HC74GE2
D-FF
IC311 (1/2)
IC332 (1/6)
IC332
UPD74HC04GE2
INVERTER
TP303
IC308
MC74HC273AF
D-FFS
IC309
MC74HC273AF
D-FFS
IC302
MN6624
DIGITAL SIGNAL PROCESSOR
X302 (28MHz)
IC307
SRM2
S RAM
rec / play
T = 2.8μs.
T = 30ms.
T = 10.4μs.
F = 9.408MHz
T = 0.21μs.
T = 0.43μs.
T = 15ms.
T = 8ms.
T = 120ms.
F = 8MHz
F = 48kHz
F = 1.536MHz
F = 24.576MHz
F = 24MHz
0.2μs. 2V/DIV.
F = 28MHz

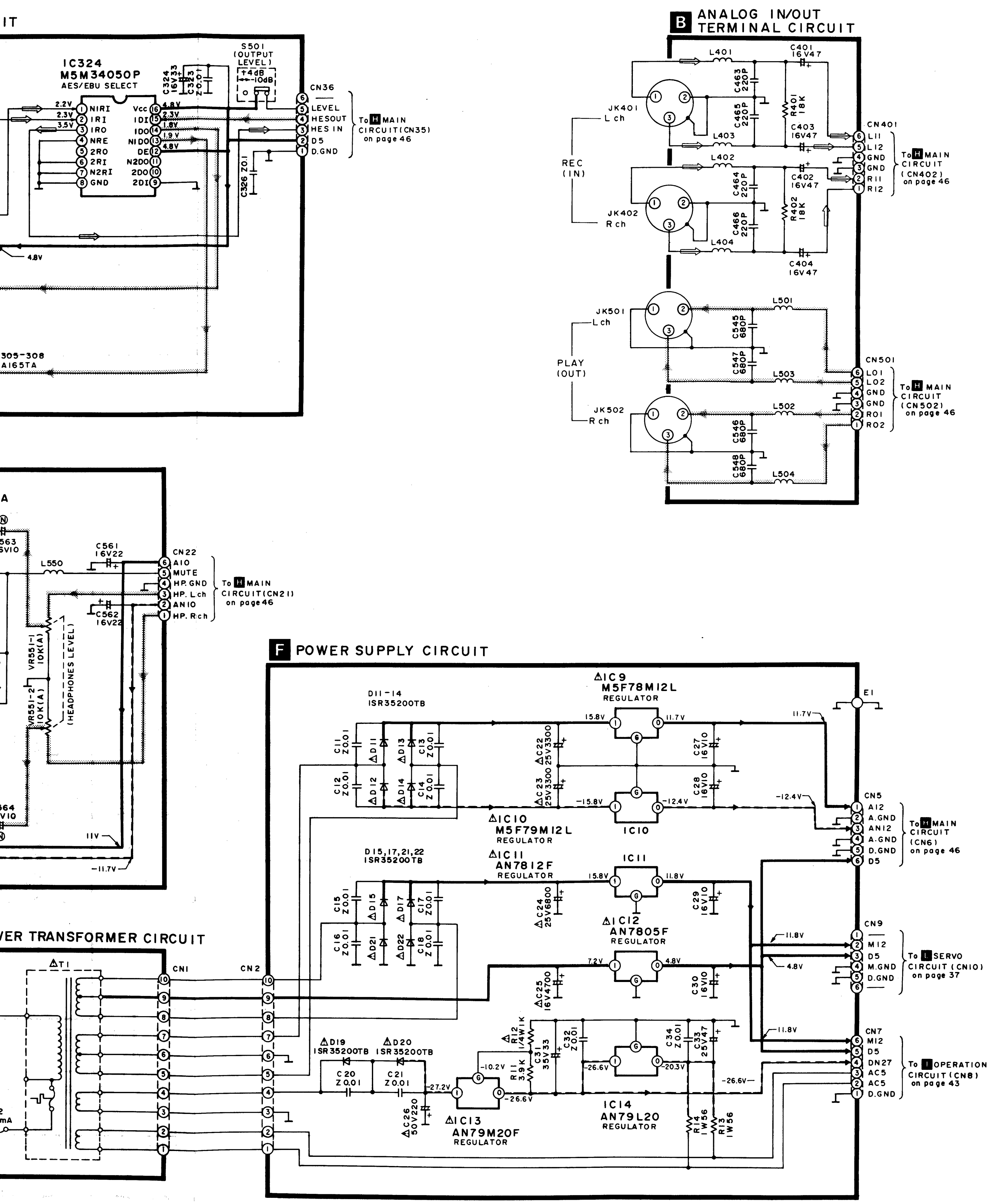

36
37
38
39
40
41
42
43
44
45
IC333 UPD74HC00G NAND GATE
IC333 (1/4)
TP303
IC308 MC74HC273AF D-FFS
IC309 MC74HC273AF D-FFS
IC331 (1/4)
IC331 MC74HC125AF 3-STATE BUS BUFFER
IC301 MN18P83213DP SYSTEM CONTROL
TP302
CN26
HSW
IDPP
PCMCIF
IPF
FLGCK
FLGDT
SUBCIF
GND
TEST CONNECTOR (To FLAG COUNTER)
CN41
RF GND
PBDT
RF GND
PBCK
RFENV
SRPR
SRRF
SRWND2
SRWND1
To K RF CIRCUIT (CN42) on page 42
R356 330
R353 100K
CN43
NPMUTE
D.GND
MRDY
MSTB
MBUS3
MBUS2
MBUS1
MBUS0
HSW
NRST2
R3CP
ENVT
FCH
VFPLFS
HFCH
PLLOFS
To L SERVO CIRCUIT (CN44) on page 37
R357 560
R358 560
R359 330
CN29
NPRDY
PCLK
PRXD
PTXD
NRST2
To I OPERATION CIRCUIT (CN301) on page 43
IC310 S22S121F10 NON-VOLATILE RAM
IC302 MN6624 DIGITAL SIGNAL PROCESSOR
X301 (8MHz)
C392 0.01
C385 6.3V100
C384 0.01
R346 47K
R345 47K
R360 560
R361 560
R362 560
R363 560
R364 560
R369 560
R370 560
R371 560
R365 560
R366 560
R368 560
R367 330
IC332 (1/6)
IC332 UPD74HC04GE2 INVERTER
IC311 UPD74HC74GE2 D-FF
IC311 (1/2)
C386 0.01
C390 0.01
C391 6.3V33
C388 0.01
C335 0.22
C332 K1000P
X302 (28MHz)
C331 C5P
C333 15P
L305 2.2μH
R344 100K
D318 MA165TA
C334 0.01
R343 100K
D319 MA165TA
IC307 SRM2A256LM10 S RAM
Q302 XN1112TW SWITCHING
Q301 XN1112TW SWITCHING
Q401 (1/2) XN1212TW SWITCHING
R350 3.3K
R351 3.3K
R354 3.3K
R349 3.3K
R348 3.3K
R347 4.7K
R352 100K
C336 0.01
IC306 MN1281R-TA RESET
play
rec
rec/play
T=30ms.
T=120ms.
T=15ms.
T=8ms.
T=1.5ms.
T=6ms.
T=16.5ms.
T=10.4μs.
T=0.21μs.
T=0.43μs.
F=9.408MHz
F=48kHz
F=1.536MHz
F=24.576MHz
F=24MHz
F=8MHz
F=28MHz
0.2μs. 2V/DIV.
4.8V

Note 3:

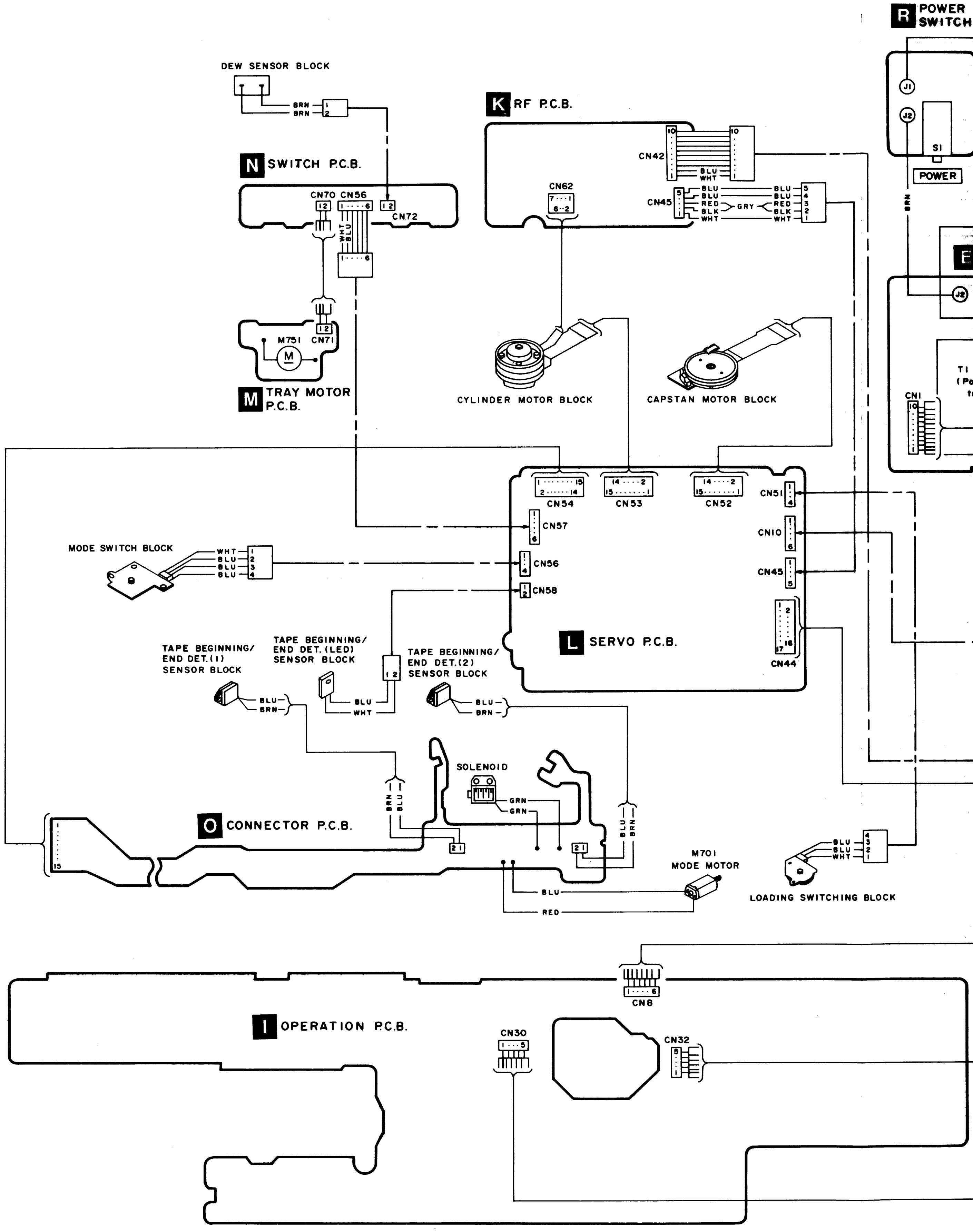
- **S501** : Output level selector switch (+4dBu/10dBu).
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1K=1,000 (Ω), 1M=1,000k (Ω)
- Capacity are in micro-farads (μF) unless specified otherwise.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  ( ).........Voltage values at recording mode.
  For measurement us EVM.
- Important safety notice
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- (▬▬▬) indicates +B (bias).
- (▬ ▬ ▬) indicates −B (bias).
- (⇢) indicates the flow of the playback signal.
- (⇨) indicates the flow of the recording signal.


O CONNECTOR CIRCUIT
S701 (CASSETTE SWITCH)
S701-3
S701-1
S701-2
TH3
TH1
TH2
M701 MODE MOTOR
IC701
IC702
IC701, 702
ON2170
FG SENSOR
A B C D E F G H I J K L M N O
P
Q
To L SERVO CIRCUIT (CN54, 58) on page 40
SOLENOID
TAPE BEGINNING/ ENDING DET.(1) SENSOR BLOCK
TAPE BEGINNING/ ENDING DET.(LED) SENSOR BLOCK
TAPE BEGINNING/ ENDING DET.(2) SENSOR BLOCK
Q702 REQ0014 BEGINNING/ ENDING DET.
D701 LN59JR716SL
Q701 REQ0014 BEGINNING/ ENDING DET.

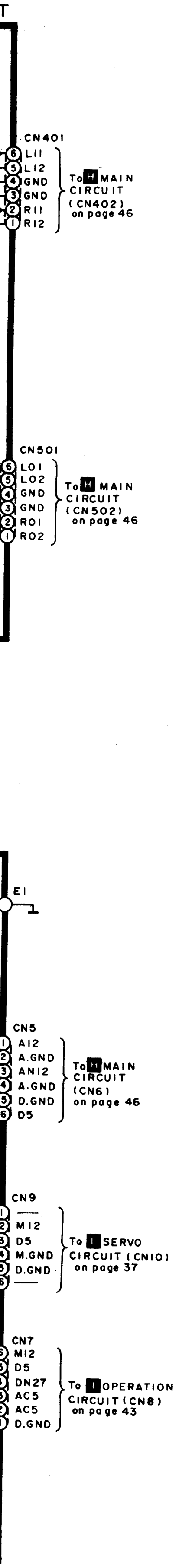

A DIGITAL IN/OUT TERMINAL CIRCUIT
AES/EBU
REC(IN)
PLAY(OUT)
JK301
JK302
C301 0.22
C302 0.22
C305 Z0.01
R305 220
R315 220
R301 100
R302 100
C303 J47P
C304 J47P
D301-304 MA165TA
D301 D302 D303 D304
R303 15K
R304 15K
IC324
M5M34050P
AES/EBU SELECT
NIRI IRI IRO NRE 2RO 2RI N2RI GND
Vcc IDI IDO NIDO DE N2DO 2DO 2DI
2.2V 2.3V 3.5V
4.8V 2.3V 1.8V 1.9V 4.8V
C324 16V33
C323 Z0.01
C326 Z0.1
S501 (OUTPUT LEVEL)
+4dB
-10dB
CN36
LEVEL
HESOUT
HES IN
D5
D.GND
To H MAIN CIRCUIT(CN35) on page 46
4.8V
C307 0.22
R307 27
Z301
C306 Z0.1
R306 10K
C309 K150P
C310 K150P
C308 0.22
R308 27
Z302
D305 D306 D307 D308
D305-308 MA165TA
C HEADPHONES JACK CIRCUIT
IC551,552
M5218AL
CLASS AA HEADPHONES AMP
IC552 (1/2)
IC551 (1/2)
Q551,552
2SD1450RSTTA
MUTING
R585 33
R583 10
R587 3.3K
R589 1K
R591 120
R581 100K
R577 10K
C553 100P
R575 1K
C563 16V10
C561 16V22
C562 16V22
L550
L551
L552
C555 0.1
C551 0.1
C556 0.1
C552 0.1
C550 0.1
Q553
Q554
Q553,554
2SD1450RSTTA
MUTING
R595 2.2K
R596 2.2K
R579 12K
R580 12K
Q551
Q552
R593 2.2K
R594 2.2K
VR551-1 10K(A)
VR551-2 10K(A)
(HEADPHONES LEVEL)
CN22
A10
MUTE
HP.GND
HP. Lch
AN10
HP. Rch
To H MAIN CIRCUIT(CN21) on page 46
JK550 HEADPHONES
R592 120
R582 100K
R578 10K
C554 100P
R588 3.3K
R590 1K
R586 33
R584 10
R576 1K
C564 16V10
11V
-11.7V
D AC IN CIRCUIT
AC IN
(230-240V) (50/60Hz)
JK1
L2
L1
J3
J1
J4
R POWER SWITCH CIRCUIT
S1 (POWER)
C1 1000P
J2
E POWER TRANSFORMER CIRCUIT
T1
F2 T200mA
CN1
CN2
F POWER SUPPLY CIRCUIT
D11-14 1SR35200TB
C11 Z0.01
C12 Z0.01
C13 Z0.01
C14 Z0.01
D15,17,21,22 1SR35200TB
C15 Z0.01
C16 Z0.01
C17 Z0.01
C18 Z0.01
D19 1SR35200TB
D20 1SR35200TB
C20 Z0.01
C21 Z0.01
C26 50V220
IC13 AN79M20F REGULATOR
-27.2V
-10.2V


IT
IC324
M5M34050P
AES/EBU SELECT
S501 (OUTPUT LEVEL)
+4dB
-10dB
CN36
LEVEL
HESOUT
HES IN
D5
D.GND
To H MAIN CIRCUIT (CN35) on page 46
305-308
A165TA
B ANALOG IN/OUT TERMINAL CIRCUIT
L401
C401 16V47
C463 220P
C465 220P
R401 18K
C403 16V47
JK401 L ch
REC (IN)
L403
L402
C402 16V47
C464 220P
C466 220P
R402 18K
JK402 R ch
L404
C404 16V47
CN401
L11
L12
GND
GND
R11
R12
To H MAIN CIRCUIT (CN402) on page 46
JK501 L ch
PLAY (OUT)
L501
C545 680P
C547 680P
L503
JK502 R ch
L502
C546 680P
C548 680P
L504
CN501
LO1
LO2
GND
GND
RO1
RO2
To H MAIN CIRCUIT (CN502) on page 46
A
C561 16V22
L550
CN22
A10
MUTE
HP.GND
HP. Lch
AN10
HP. Rch
To H MAIN CIRCUIT (CN21) on page 46
C562 16V22
VR551-1 10K(A)
VR551-2 10K(A)
(HEADPHONES LEVEL)
11V
-11.7V
F POWER SUPPLY CIRCUIT
D11-14 ISR35200TB
ΔIC9 M5F78M12L REGULATOR
ΔIC10 M5F79M12L REGULATOR
IC10
D15,17,21,22 ISR35200TB
ΔIC11 AN7812F REGULATOR
IC11
ΔIC12 AN7805F REGULATOR
ΔD19 ISR35200TB
ΔD20 ISR35200TB
ΔIC13 AN79M20F REGULATOR
IC14 AN79L20 REGULATOR
E1
CN5
A12
A.GND
AN12
A.GND
D.GND
D5
To H MAIN CIRCUIT (CN6) on page 46
CN9
M12
D5
M.GND
D.GND
To L SERVO CIRCUIT (CN10) on page 37
CN7
M12
D5
DN27
AC5
AC5
D.GND
To I OPERATION CIRCUIT (CN8) on page 43
VER TRANSFORMER CIRCUIT
ΔT1
CN1
CN2

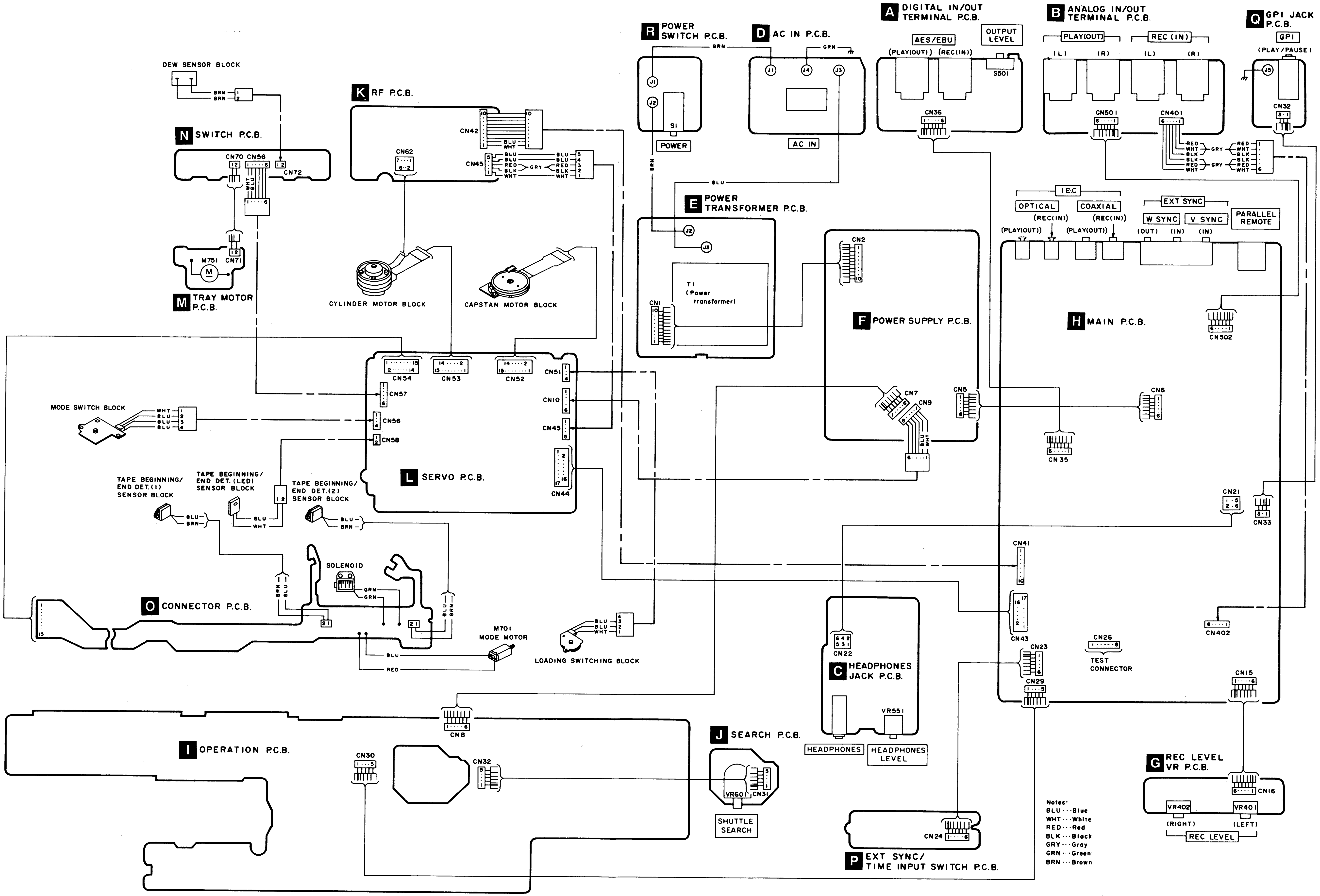
WIRING CONNECTION DIAGRAM


R POWER SWITCH
S1
POWER
DEW SENSOR BLOCK
K RF P.C.B.
CN42
CN62
CN45
N SWITCH P.C.B.
CN70
CN56
CN72
M751
CN71
M TRAY MOTOR P.C.B.
CYLINDER MOTOR BLOCK
CAPSTAN MOTOR BLOCK
CN54
CN53
CN52
CN51
CN57
CN10
CN56
CN45
CN58
CN44
MODE SWITCH BLOCK
L SERVO P.C.B.
TAPE BEGINNING/END DET.(1) SENSOR BLOCK
TAPE BEGINNING/END DET.(LED) SENSOR BLOCK
TAPE BEGINNING/END DET.(2) SENSOR BLOCK
SOLENOID
O CONNECTOR P.C.B.
M701 MODE MOTOR
LOADING SWITCHING BLOCK
CN1
CN8
I OPERATION P.C.B.
CN30
CN32

■WIRING CONNECTION DIAGRAM



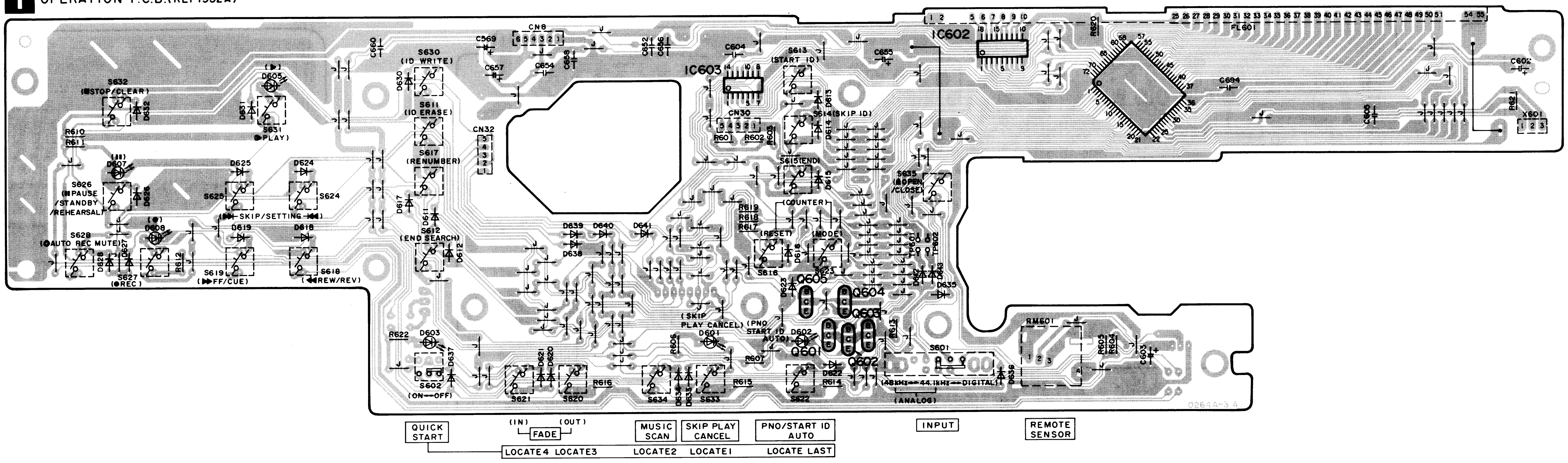
CN401
L11
L12
GND
GND
R11
R12
To H MAIN CIRCUIT (CN402) on page 46
CN501
LO1
LO2
GND
GND
RO1
RO2
To H MAIN CIRCUIT (CN502) on page 46
E1
CN5
A12
A.GND
AN12
A.GND
D.GND
D5
To H MAIN CIRCUIT (CN6) on page 46
CN9
M12
D5
M.GND
D.GND
To L SERVO CIRCUIT (CN10) on page 37
CN7
M12
D5
DN27
AC5
AC5
D.GND
To I OPERATION CIRCUIT (CN8) on page 43



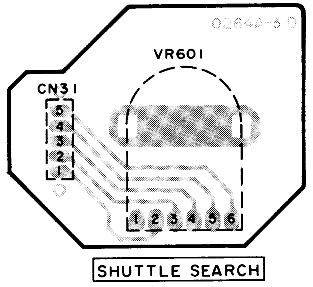
A DIGITAL IN/OUT TERMINAL P.C.B.
AES/EBU
OUTPUT LEVEL
(PLAY(OUT)) (REC(IN))
S501
CN36
B ANALOG IN/OUT TERMINAL P.C.B.
PLAY(OUT)
REC (IN)
(L) (R) (L) (R)
CN501
CN401
Q GPI JACK P.C.B.
GPI
(PLAY/PAUSE)
J5
CN32
R POWER SWITCH P.C.B.
S1
POWER
D AC IN P.C.B.
AC IN
J1 J2 J3 J4
BRN
GRN
BLU
DEW SENSOR BLOCK
K RF P.C.B.
CN42
CN62
CN45
N SWITCH P.C.B.
CN70 CN56
CN72
M751 CN71
M TRAY MOTOR P.C.B.
E POWER TRANSFORMER P.C.B.
T1 (Power transformer)
CN1
CYLINDER MOTOR BLOCK
CAPSTAN MOTOR BLOCK
F POWER SUPPLY P.C.B.
CN2
CN7
CN9
CN5
IEC
OPTICAL
COAXIAL
(REC(IN))
(PLAY(OUT))
EXT SYNC
W SYNC
V SYNC
(OUT) (IN) (IN)
PARALLEL REMOTE
H MAIN P.C.B.
CN502
CN6
CN35
CN21
CN33
CN41
CN43
CN26
TEST CONNECTOR
CN402
CN23
CN29
CN15
CN54 CN53 CN52
CN51
CN57
CN10
CN56
CN45
CN58
CN44
MODE SWITCH BLOCK
L SERVO P.C.B.
TAPE BEGINNING/ END DET.(1) SENSOR BLOCK
TAPE BEGINNING/ END DET.(LED) SENSOR BLOCK
TAPE BEGINNING/ END DET.(2) SENSOR BLOCK
SOLENOID
O CONNECTOR P.C.B.
M701 MODE MOTOR
LOADING SWITCHING BLOCK
C HEADPHONES JACK P.C.B.
CN22
VR551
HEADPHONES
HEADPHONES LEVEL
I OPERATION P.C.B.
CN8
CN30
CN32
J SEARCH P.C.B.
VR601 CN31
SHUTTLE SEARCH
P EXT SYNC/ TIME INPUT SWITCH P.C.B.
CN24
G REC LEVEL VR P.C.B.
CN16
VR402 VR401
(RIGHT) (LEFT)
REC LEVEL
Notes:
BLU···Blue
WHT···White
RED···Red
BLK···Black
GRY···Gray
GRN···Green
BRN···Brown

PRINTED CIRCUIT BOARDS

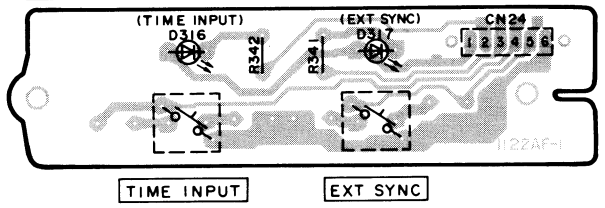
I OPERATION P.C.B.(REP1952A)


S632 (STOP/CLEAR)
S631 (PLAY)
S626 (PAUSE/STANDBY/REHEARSAL)
S628 (AUTO REC MUTE)
S627 (REC)
S625
S624
SKIP/SETTING
S619 (FF/CUE)
S618 (REW/REV)
S630 (ID WRITE)
S611 (ID ERASE)
S617 (RENUMBER)
S612 (END SEARCH)
CN8
CN32
IC603
CN30
S613 (START ID)
S614 (SKIP ID)
S615 (END)
(COUNTER)
S616 (RESET)
S623 (MODE)
S635 (OPEN/CLOSE)
IC602
FL601
X601
Q605
Q604
Q603
Q601
Q602
(SKIP PLAY CANCEL)
(PNO START ID AUTO)
S601
(48kHz—44.1kHz—DIGITAL)
(ANALOG)
RM601
S602 (ON—OFF)
S621
S620
S634
S633
S622
QUICK START
(IN) FADE (OUT)
MUSIC SCAN
SKIP PLAY CANCEL
PNO/START ID AUTO
INPUT
REMOTE SENSOR
LOCATE4 LOCATE3
LOCATE2 LOCATE1
LOCATE LAST

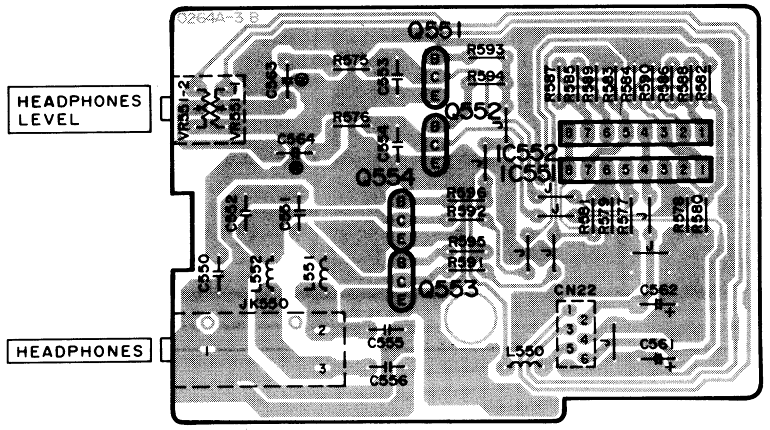
J SEARCH P.C.B.(REP1952A)


VR601
CN31
SHUTTLE SEARCH

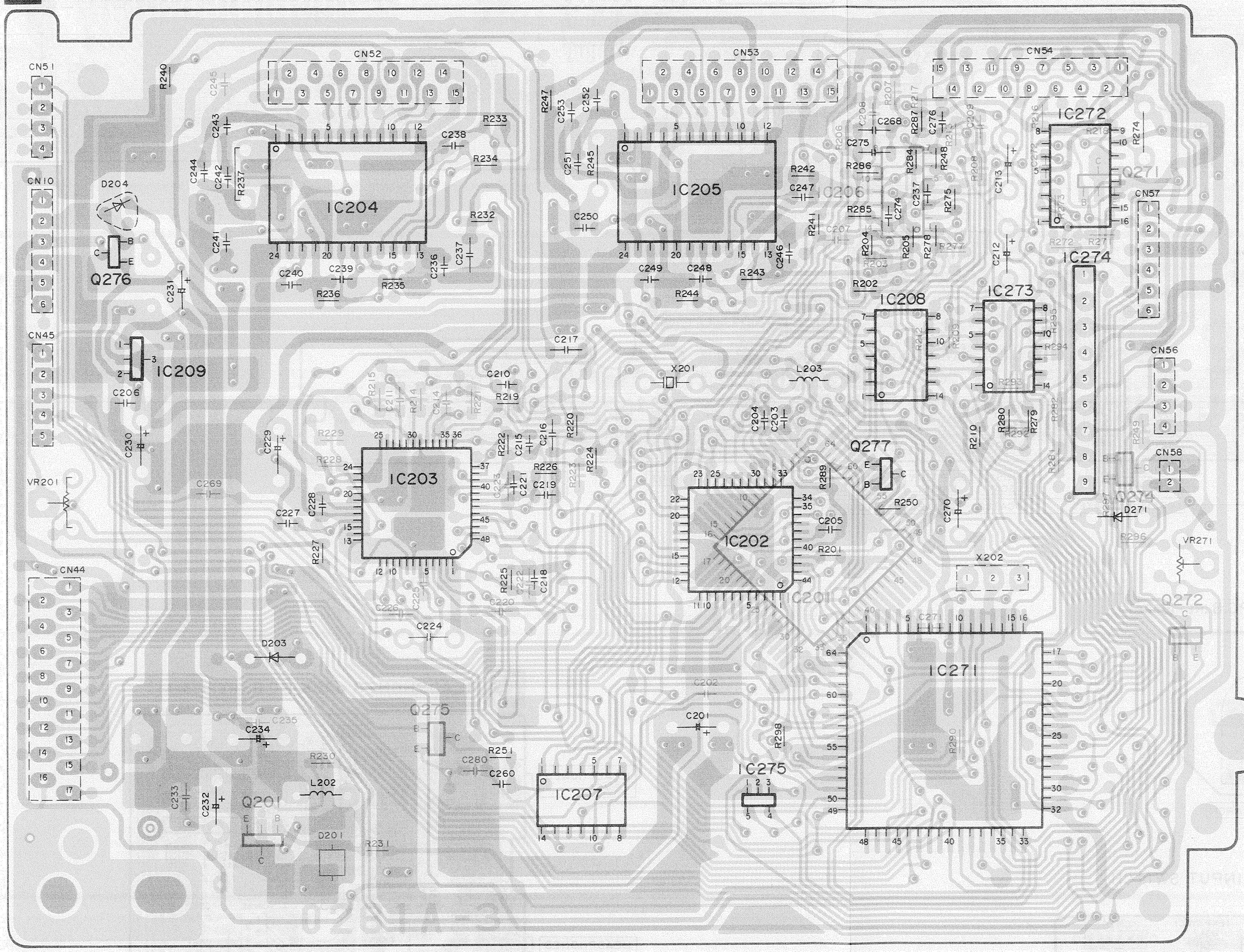
P EXT SYNC/TIME INPUT SWITCH P.C.B. (REP1951B)


(TIME INPUT) D316
R342
R341
(EXT SYNC) D317
CN24
TIME INPUT
EXT SYNC

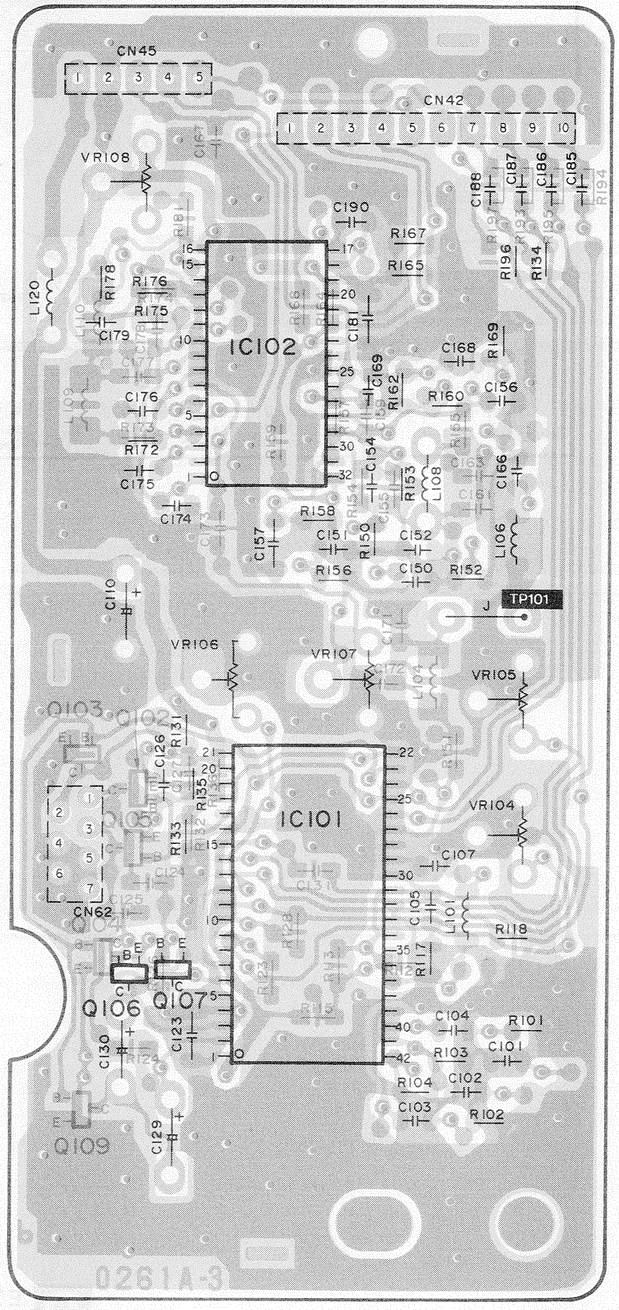
C HEADPHONES JACK P.C.B.(REP1952A)


Q551
Q552
Q554
Q553
IC552
IC551
VR551
JK550
CN22
L550
HEADPHONES LEVEL
HEADPHONES

L SERVO P.C.B. (RFKBV3700-0)


CN51
CN10
CN45
CN44
CN52
CN53
CN54
CN57
CN56
CN58
IC204
IC205
IC272
IC274
IC208
IC273
IC209
IC203
IC202
IC201
IC271
IC207
IC275
Q276
Q277
Q274
Q271
Q272
Q275
Q201
D204
D203
D201
D271
X201
X202
L203
L202
VR201
VR271
0261A-3

K RF P.C.B. (RFKBV3700-N)

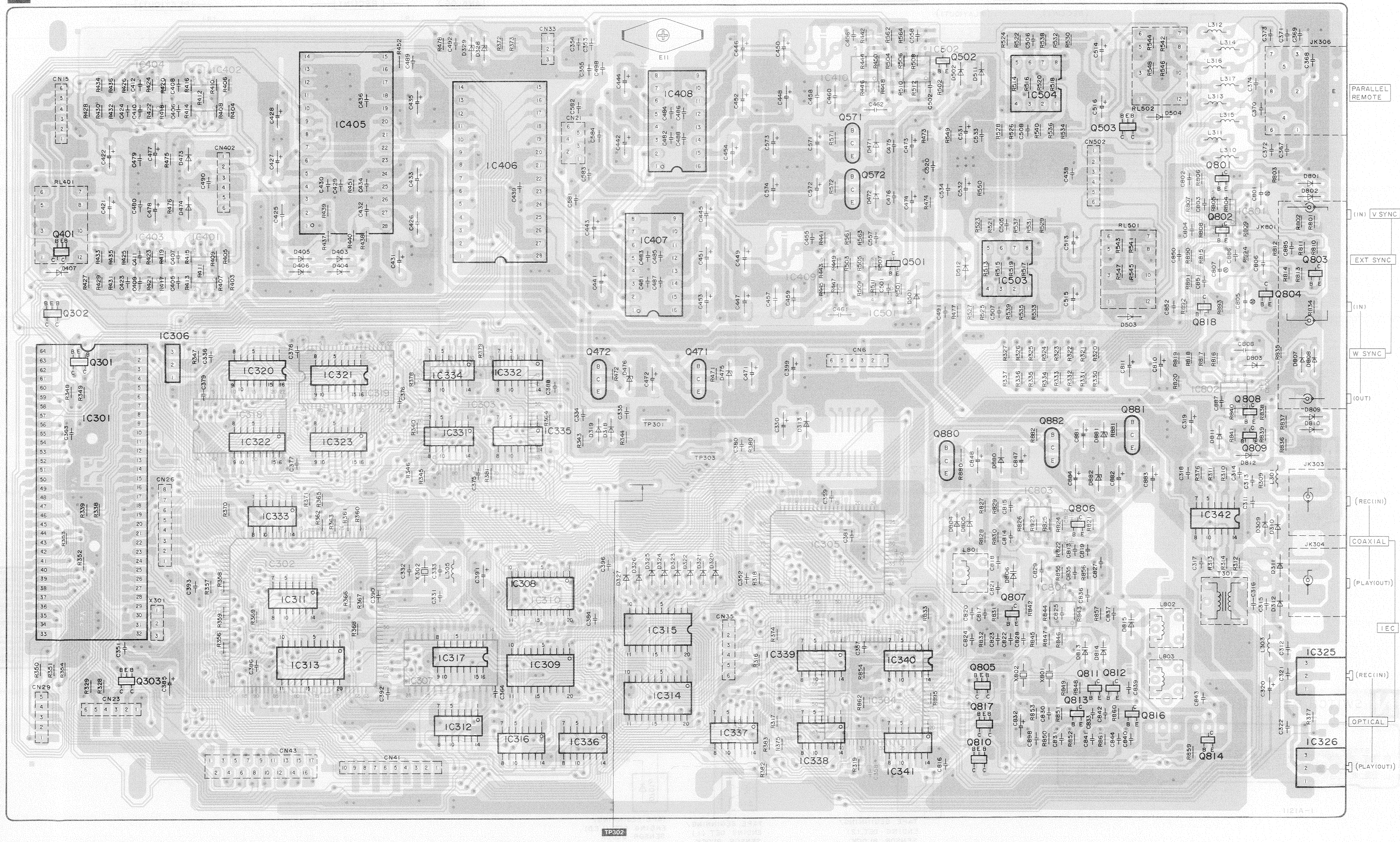

CN45
CN42
CN62
IC102
IC101
VR108
VR106
VR107
VR105
VR104
Q103
Q102
Q104
Q105
Q106
Q107
Q109
TP101
L120
L101
0261A-3

Notes:

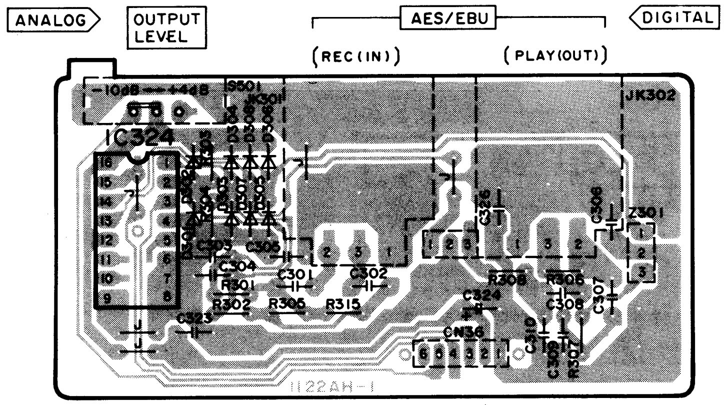
- In this printed circuit board diagram, the parts and foil patterns on the board facing toward you are printed in black.
  The opposite side is printed in blue.
- The "●" mark denotes the connection points of double-faced foil patterns (through holes) on both sides of the printed circuit board.
- This printed circuit board diagram may be modified at any time with the development of new technology.

11 12 13 14 15 16 17 18 19

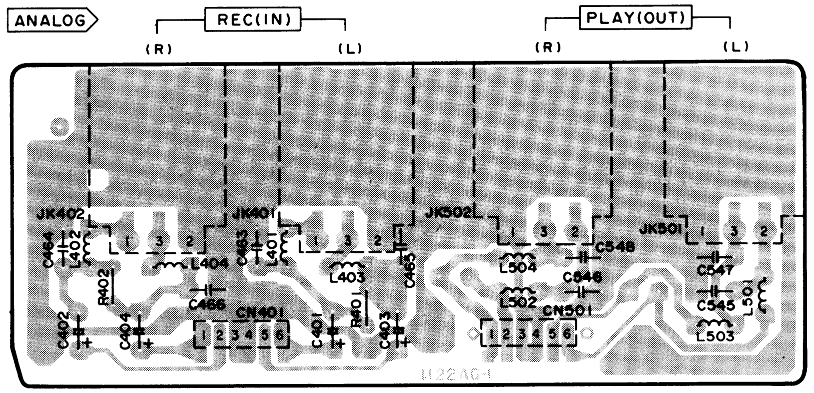
H MAIN P.C.B. (REP1950A)


CN15
RL401
Q401
Q302
Q301
IC301
IC306
IC320
IC321
IC322
IC323
IC333
IC311
IC313
IC317
IC312
IC316
IC336
IC308
IC309
IC334
IC332
IC331
IC335
IC404
IC402
IC403
IC401
CN402
IC405
IC406
CN33
E11
IC408
IC407
IC410
IC409
IC501
IC502
Q502
Q571
Q572
Q501
IC504
IC503
Q503
RL502
RL501
CN502
Q472
Q471
CN6
TP301
TP303
IC305
IC315
IC314
IC339
IC340
IC337
IC338
IC341
CN35
CN26
CN29
CN23
X301
Q303
CN43
CN41
Q880
Q882
Q881
IC803
Q806
IC804
Q807
Q805
Q817
Q810
Q811
Q812
Q813
Q816
Q814
L801
L802
L803
Q801
Q802
Q803
Q804
Q818
IC801
IC802
Q808
Q809
JK801
IC342
T301
JK306
JK303
JK304
IC325
IC326
PARALLEL REMOTE
(IN) V SYNC
EXT SYNC
(IN)
W SYNC
(OUT)
(REC(IN))
COAXIAL
(PLAY(OUT))
IEC
(REC(IN))
OPTICAL
(PLAY(OUT))
TP302

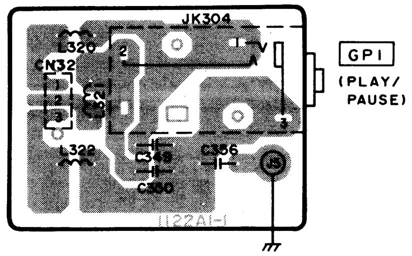
A DIGITAL IN/OUT TERMINAL P.C.B. (REP1951B)


ANALOG
OUTPUT LEVEL
AES/EBU
DIGITAL
(REC(IN))
(PLAY(OUT))
-10dB — +4dB
S501
JK301
JK302
IC324
Z301
C304
R301
C301
C302
R302
R305
R315
C323
R308
R306
C324
C326
C306
C307
CN36
1122AH-1

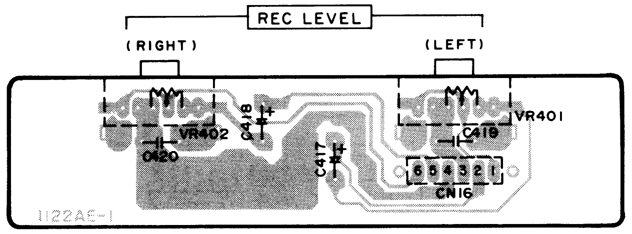
B ANALOG IN/OUT TERMINAL P.C.B. (REP1951B)


ANALOG
REC(IN)
(R)
(L)
PLAY(OUT)
(R)
(L)
JK402
JK401
JK502
JK501
L404
L403
L504
L502
L501
L503
C548
C546
C547
C545
C466
CN401
CN501
R402
R401
C402
C404
C401
C403
1122AG-1

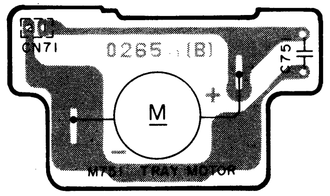
Q GPI JACK P.C.B. (REP1951B)


JK304
CN32
C320
L322
C348
C356
C350
GPI
(PLAY/ PAUSE)
1122AI-1

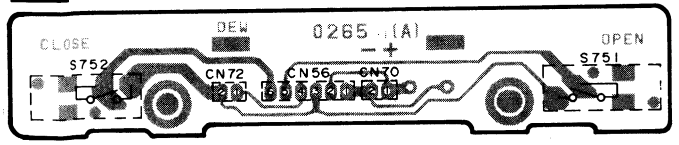
G REC LEVEL VR P.C.B. (REP1951B)


REC LEVEL
(RIGHT)
(LEFT)
VR402
VR401
C418
C419
C420
C417
CN16
1122AE-1

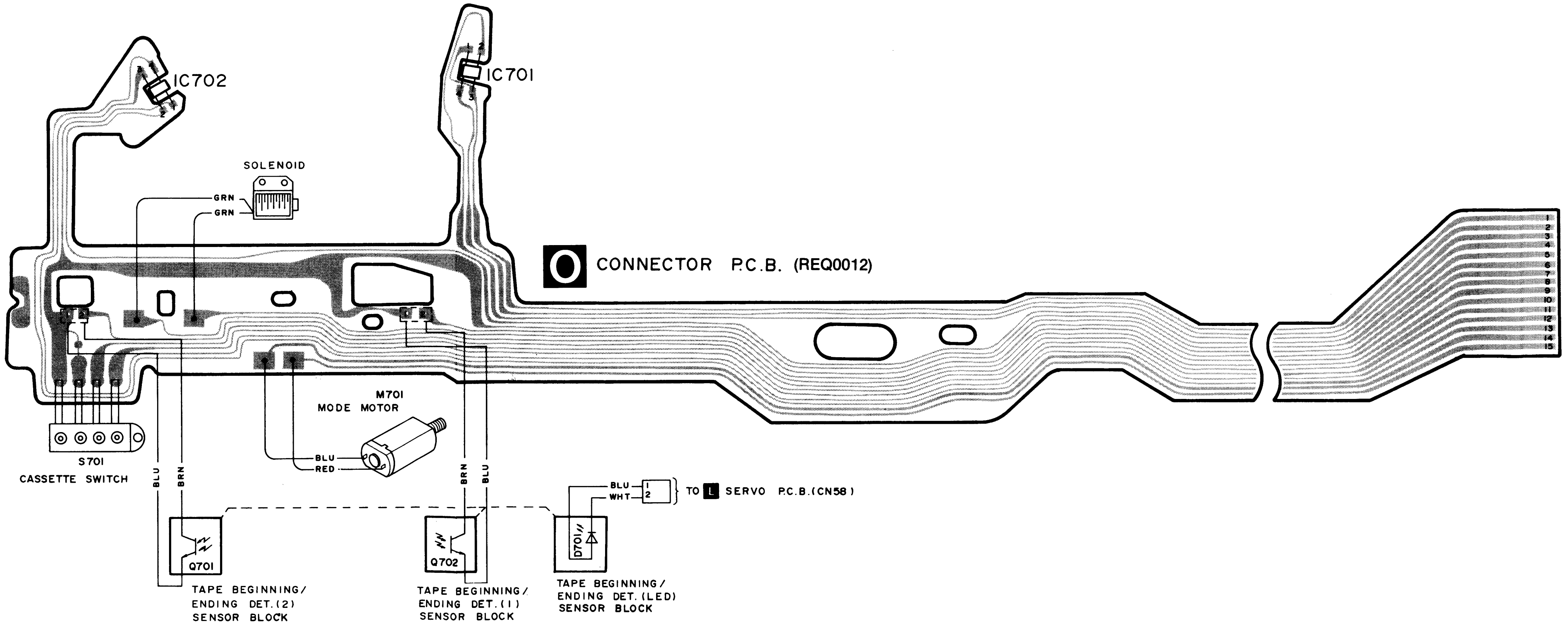
M TRAY MOTOR P.C.B. (REP0421A)


CN71
0265 (B)
C75
M
M751 TRAY MOTOR

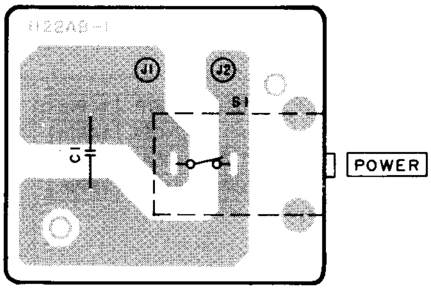
N SWITCH P.C.B. (REP0421A)


CLOSE
DEW
0265 (A)
OPEN
S752
S751
CN72
CN56
CN70

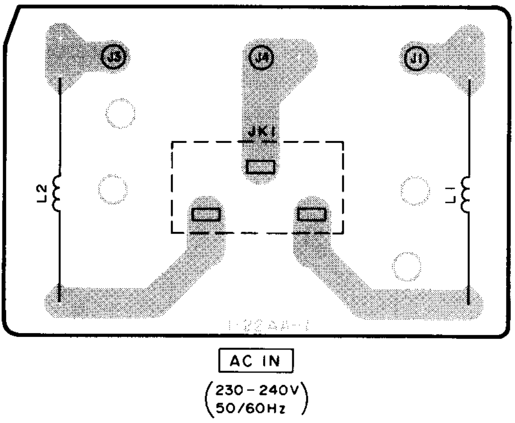
O CONNECTOR P.C.B. (REQ0012)


IC702
IC701
SOLENOID
GRN
GRN
M701
MODE MOTOR
BLU
RED
S701
CASSETTE SWITCH
BLU
BRN
BRN
BLU
Q701
TAPE BEGINNING/ ENDING DET.(2) SENSOR BLOCK
Q702
TAPE BEGINNING/ ENDING DET.(1) SENSOR BLOCK
D701
TAPE BEGINNING/ ENDING DET.(LED) SENSOR BLOCK
BLU
WHT
1
2
TO L SERVO P.C.B.(CN58)
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

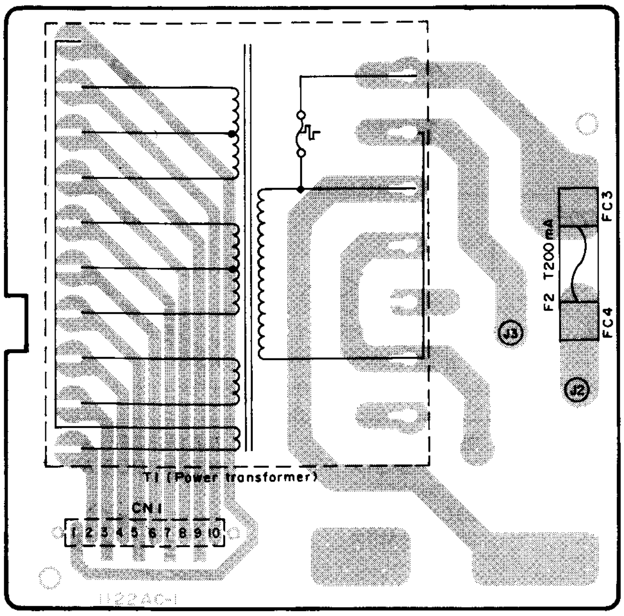
R POWER SWITCH P.C.B. (REP1951B)


J1
J2
S1
C1
POWER
1122AB-1

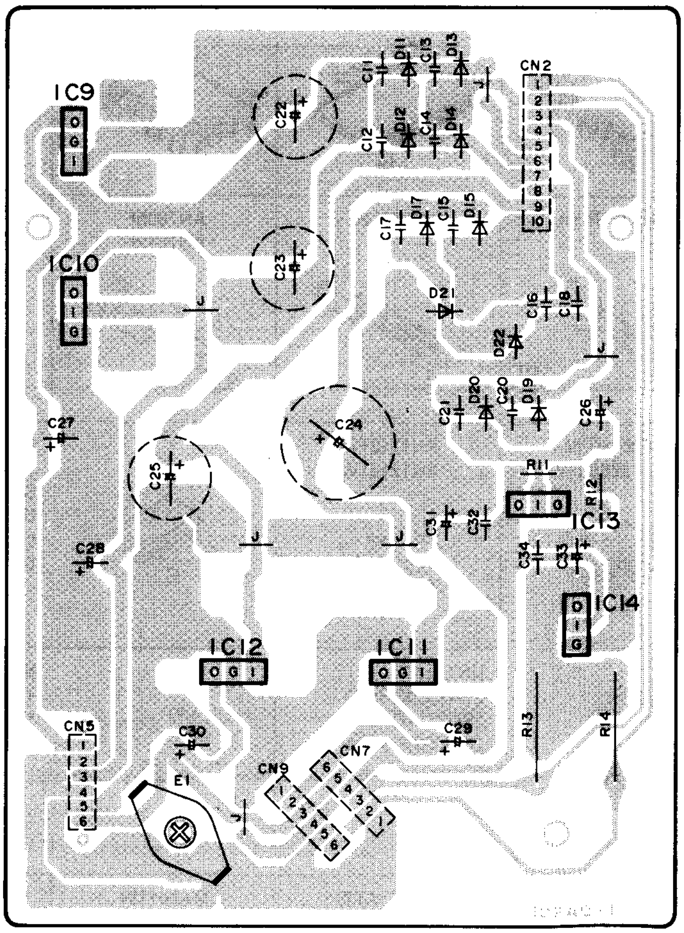
D AC IN P.C.B. (REP1951B)


J3
J4
J1
JK1
L2
L1
AC IN
(230-240V
50/60Hz)

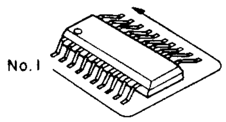
E POWER TRANSFORMER P.C.B. (REP1951B)


FC3
F2 T200mA
FC4
J3
J2
T1 (Power transformer)
CN1
1 2 3 4 5 6 7 8 9 10
1122AC-1

F POWER SUPPLY P.C.B. (REP1951B)

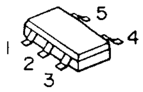

IC9
O
G
I
IC10
C22
C23
C24
C25
C26
C27
C28
C29
C30
C31
C32
C33
C34
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
D11
D12
D13
D14
D15
D17
D19
D20
D21
D22
CN2
2 3 4 5 6 7 8 9 10
J
R11
R12
R13
R14
IC13
IC14
IC12
IC11
CN5
1 2 3 4 5 6
E1
CN9
CN7
1 2 3 4 5 6
1122AG-1

■TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

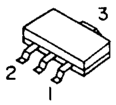


AN1393S	8Pin	M5228FPE2	14Pin	UPD74HC00G	14Pin	AN6873S	18Pin
M5219FPE1	8Pin	MC74HC02AF	14Pin	UPD74HC04G	14Pin	S22S12IF10	18Pin
M5238FPE1	8Pin	MC74HC125AF	14Pin	UPD74HC04GE2	14Pin	MC74HC273AF	20Pin
NJM4580EDTE1	8Pin	MC74HC164F	14Pin	AN6607NSE2	16Pin	AN7035SCE2	32Pin
AN1339SE2	14Pin	MN4066BS-T2	14Pin	MC74HC595AF	16Pin	AN7030SE2	42Pin
NJM5532DD	8 Pin						

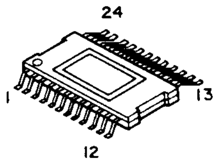
TC4S81FTX

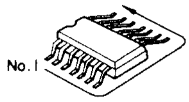


AN78L05ME2



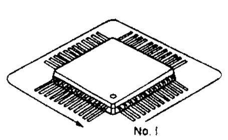
AN3841SR



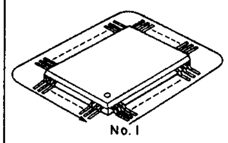


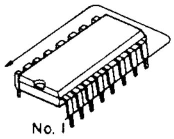
T74HCU04AFTP	14Pin
UPD74HC74GE2	14Pin
TC74HC166AF	16Pin
TC74HC541AF	20Pin

MN53020SDQ	44Pin	MN17541SDN2	64Pin
AN8320NFA	48Pin	MN6742SDR	64Pin
		MN53040VPS	84Pin
		MN56100SDS	84Pin
		MN6624	124Pin



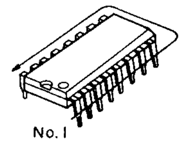
M50754-165FP	72Pin
L7A0541	80Pin



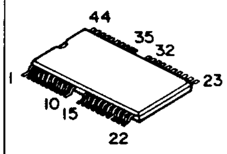


M5216P	8Pin
M5M34050P	16Pin
SM5843AP	28Pin
SRM2A256LM10	28Pin

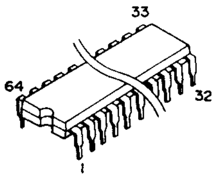
PCM1702P	16Pin
CS5339-KP	28Pin



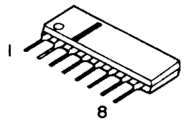
UPD424260-80


44
35
32
1
23
10
15
22

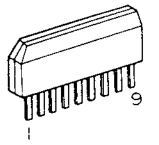
MN18P8321SDP



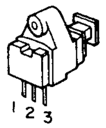
M5218AL



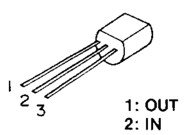
TA7291S



T0RX178A
T0TX178

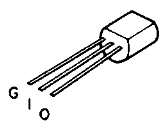


MN1281R-TA

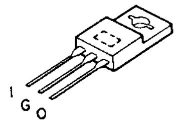


1: OUT
2: IN
3: GND

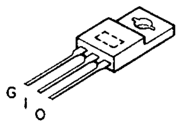
AN79L20



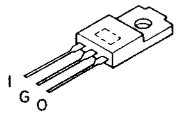
AN7805F
AN7812F



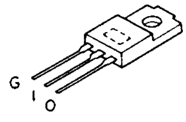
AN79M20F



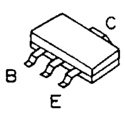
M5F78M12L



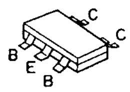
M5F79M12L

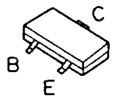


2SB956RTW
2SD1280STW



XN1112TW
XN1212TW

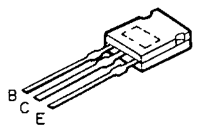


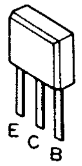


DTA114EKTW
DTA123JKTW
DTB113ZKTW
DTC124EKTW
UN2211TX
UN5216TW

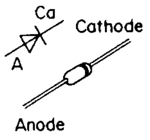
2SB709RTW
2SB1218ASTX
2SC3931CTX
2SC3937TW
2SD1819ASTX

2SB1357DEFTA
2SD2037DEFTA



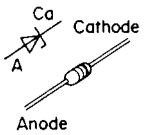


UN4111TA
2SA1309QRSTA
2SC3311QRSTA
2SD1450RSTTA

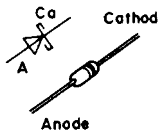

Ca
Cathode
A
Anode

MA165TA
1N4606TR
1S2473TR
1SR35200TB

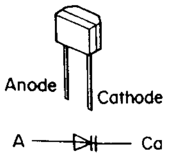
MA4056MTA


Ca
Cathode
A
Anode

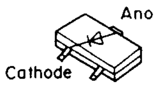
MA719TA


Ca
Cathode
A
Anode

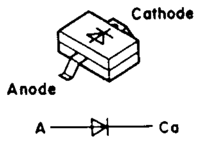
RVDSVC321TA


Anode
Cathode
A
Ca

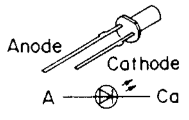
MA151ATW


Anode
Cathode

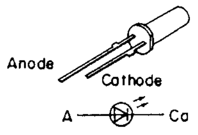
MA701TW


Cathode
Anode
A
Ca

LN28RCPP-JF


Anode
Cathode
A
Ca

LN29RPH-JF1
LN31GPH-JF2
LN49YPH-JF1


Anode
Cathode
A
Ca

■TERMINAL FUNCTION OF IC'S

• IC101 (AN7030SE2): RF AMP.

Pin No.	Mark	I/O Division	Function
1	V_{CC} 1	I	Power supply terminal
2	ACH FB	O	Playback feed back signal (A ch)
3	ACH IN	I	Playback amp. signal (A ch)
4	GND 1	—	GND terminal
5	BCH IN	I	Playback amp. signal (B ch)
6	BCH FB	O	Playback feed back signal (B ch)
7	AREC PCM	I	RF recording level adj. terminal
8	AREC PLT		
9	AREC ATF		
10	BREC ATF		
11	BREC PLT		
12	BREC PCM		
13	REC CNT 1	I	Track pitch signal
14	REC CNT 2	I	ATF area det. signal
15	SRRF IN	I	Recording signal
16	GND 2	—	GND terminal
17	VREF	O	Reference voltage terminal (Not used, open)
18	AREC OUT	O	Recording signal (A ch)
19	BREC OUT	O	Recording signal (B ch)
20	BTL REC	O	Recording control signal
21	V_{CC} 2	I	Power supply terminal
22	REC ON	O	Recording drive terminal (REC: "H")
23	PLAY ON	O	Playback drive terminal (PLAY: "H")
24	HSW	I	Head switching signal
25	AR/RSEL	I	Not used, connected to power supply
26	R/PSEL	I	Recording/playback select signal (REC: "H", PLAY: "L")
27	EQ OUT	O	Equalization signal
28	EQ IN 3	I	Equalization amp. signal
29	EQ IN 2		
30	EQ IN 1		
31	BF REQ	I	Equalization amplitude drive terminal (B ch)
32	B PHASE	I	Equalization phase drive terminal (B ch)
33	B GAIN	I	Equalization gain drive terminal (B ch)
34	AF REQ	I	Equalization amplitude drive terminal (A ch)
35	A PHASE	I	Equalization phase drive terminal (A ch)
36	A GAIN	I	Equalization gain drive terminal (A ch)
37	SV RF	O	Playback signal
38	GND 3	—	GND terminal
39	A INT	I	Playback amp. signal (A ch)
40	B INT	I	Playback amp. signal (B ch)
41	B INT IN	O	Playback amp. signal (B ch)
42	A INT IN	O	Playback amp. signal (A ch)

• IC102 (AN7035SCE2): Playback PLL

Pin No.	Mark	I/O Division	Function
1	LPF	O	Buffer amp. 1 reference terminal
2	GND 1	—	GND terminal
3	ENVC	O	ENV time constant setting terminal
4	ENVR	I	ENV threshold voltage adj. terminal
5	RFENV	O	RF envelope signal
6	RSENVC	O	RSENV time constant setting terminal
7	RSRF	I	RF signal
8	DELOUT	O	RF signal
9	DELIN 1	I	Delay (45°) signal
10	DELIN 2	I	Delay (90°) signal
11	PDOUT	O	Phase comparator signal
12	VREF 1	I	V/I converter reference voltage terminal
13	VCOV	I	OSC frequency control terminal
14	R/P	I	Recording/playback select terminal (Not used, connected to GND)

Pin No.	Mark	I/O Division	Function
15	VCOR	I	OSC frequency adj. terminal
16	V_{CC} 1	I	Power supply terminal
17	VCOC 1	O	VCO terminal
18	VCOC 2	O	VCO terminal
19	V_{CC} 2	I	Power supply terminal
20	PLL CP 1	O	Clock (2 CK) signal (Not used, open)
21	PLL CP 2	O	Clock (CK) signal
22	DEMCOD	O	NRZI demodulated signal for playback signal with PLL
23	SVSYNC	O	ATF sync. signal

Pin No.	Mark	I/O Division	Function
24	GND 2	—	GND terminal
25	OP OUT 3	O	ATF 3 signal
26	OP IN 3	I	ATF 3 signal
27	OP OUT 2	O	ATF 2 signal
28	OP IN 2	I	ATF 2 signal
29	OP OUT 1	O	ATF 1 signal
30	OP IN 1	I	ATF 1 signal
31	VREF	I	Reference voltage terminal
32	SYNC IN	I	ATF sync. det. terminal

- **IC201 (MN6742SDR): Servo processor**

Pin No.	Mark	I/O Division	Function
1	OP10A	O	Cylinder rotative stop signal
2	SCK	I	Serial clock signal
3	SDA	I/O	Serial data signal
4	OSC 1	I	System clock (8 MHz) signal
5	OSC 2	O	
6	NRST	I	Reset signal
7	NC	—	Not connection
8	OP20A	O	SSP ready signal
9	NC	—	Not connection
10	V_{SS}	—	GND terminal
11	VHS	—	Not used, open
12	OP 101	O	CAPFG/RLFGT select signal
13	TP 2	O	R3CP/RLFGT select signal
14	TP 3	I	PLL off-set/parallel data signal
15	TP 4		
16	TP 5		
17	TP 6		
18	TP 7	I	PLL off-set/data effective flag terminal
19	TP 8	I	Not used, connected to power supply
20	MOS	I	Serial port/strobe signal
21	TST	I	Test mode terminal (Normal, connected to GND)
22	ENC	—	Connected to GND terminal

Pin No.	Mark	I/O Division	Function
23	NC	—	Not connection
24	NC		
25	V_{DD}	I	Power supply terminal
26	NC	—	Not connection
27	RSW	—	Not used, open
28	HAS	O	A/D input select signal
29	AVM	—	Not used, connected to GND
30	VLP	—	Not used, open
31	STM	I	R3TU or RLFGT (64 P/R) signal
32	STR	I	Comparator reference signal of STM input
33	CAE	O	Capstan velocity control signal
34	CYE	O	Cylinder velocity control signal
35	END	I	VREF or ATFTER voltage signal
36	VSY	I	$\overline{\text{CYLPG}}$ signal
37	ASH 1	I	Capstan FG or RLFGT signal after EXOR
38	NC	—	Not connection
39	AFB 1	O	Inverter amp. signal of ATFTER input (Not used, open)
40	NC	—	Not connection
41	AFG 1	I	ATF tracking error voltage terminal
42	ASH 2	O	Not used, connected to GND
43	AFB 2	O	Not used, open
44	NC	—	Not connection

Pin No.	Mark	I/O Division	Function
45	AFG 2	I	Reference voltage terminal
46	VDA	I	Power supply terminal
47	VSA	—	GND terminal
48	ORE	O	Reference voltage terminal
49	IRE	I	
50	GND	—	GND terminal
51	IPL	O	Not used, open
52	NC	—	Not connection
53	CLP	I	Not used, connected to GND
54	CP 1	O	Not used, open

Pin No.	Mark	I/O Division	Function
55	CP 2	I	Supply reel FG signal
56	NC	—	Not connection
57	NC		
58	CN 1	O	Not used, open
59	CN 2	I	Not used, connected to GND
60	CTL	O	Not used, open
61	PFG	I	Cylinder FG signal
62	PGM	I	Not used, connected to GND
63	CUL	O	Capstan rotative direction signal
64	NC	—	Not connection

• IC202 (MN53020SDQ): ATF

Pin No.	Mark	I/O Division	Function
1	NSNC	O	SYNC det. monitor terminal
2	SVAL	I	ATF select terminal
3	PCMOK	I	PCM playback monitor terminal
4	SPE	O	Starting pulse of counter track lock
5	SP 2	O	Sampling pulse signal for pilot signal of adjacent track
6	SP 1		
7	DCYLPG	I	Cylinder PG signal
8	DCAPFG 1	I	Capstan FG signal
9	DCAPFG 2		
10	DRLFGT	I	Take-up reel FG signal
11	DCYLFG	I	Cylinder FG signal
12	SYNC	I	ATF sync. det. terminal
13	NRST	I	Reset signal
14	R3CP	I	Timing signal for RF envelope signal control
15	ENVT		
16	FCH	I	System clock signal (9.408 MHz)
17	V_{DD}	I	Power supply terminal
18	V_{SS}	—	GND terminal
19	MODE 1	I	SYNC det. select terminal (Not used, connected to GND)
20	HFCH	I	Clock signal for PLL off-set data
21	PLLOFS	I	PLL off-set data signal

Pin No.	Mark	I/O Division	Function
22	TEST 6	—	Not used, connected to GND
23	P MODE	I	Pulse width select terminal
24 ∫ 28	TEST 1 ∫ TEST 5	I	Test terminal (Not used, connected to GND)
29	SPHT	—	Not used, open
30	HSWS	O	Head switching signal (33.33 Hz)
31	HSWR		
32	SEL A	I	CAPFGTU signal select terminal
33	SEL B	I	R3TU signal select terminal
34	PLL 0	O	Output signal after decoded 4 bit parallel data of PLLOFS
35	PLL 1		
36	PLL 2		
37	PLL 3		
38	MODE 2	—	Not used, open
39	V_{SS} 2	—	GND terminal
40	V_{DD} 2	I	Power supply terminal
41	R3TU	O	Building-up edge signal of R3CP/DRLFGT
42	CAPFGTU	O	Capstan FG signal/Take-up reel FG signal
43	CAPER	O	Capstan rotative direction control signal
44	NLNR	O	Track linearity monitor terminal

• IC203 (AN8320NFA): Linear servo

Pin No.	Mark	I/O Division	Function
1	FG1 AO	O	Capstan FG signal
2	FG1 AI	I	Capstan FG (−) signal
3	FG1 FI	I	Frequency characteristic setting terminal
4	CYL PG	O	Cylinder PG signal
5	PGVR	I	PG delay time adj. terminal
6	CYPGI	I	PG schmidt comparator terminal
7	GND	—	GND terminal
8	SVRF	I	ATF terminal
9	CPD	O	Det. capacity connection terminal
10	CCI	O	Full-wave rectification buffer terminal
11	CCO	I	Clamp circuit terminal
12	SP 1	I	SP 1 terminal
13	SP 2	I	SP 2 terminal
14	VSPE	I	SPE setting terminal
15	SPE	I	SPE terminal
16	CSH	I	Hold capacity connection terminal
17	ATFTER	O	ATF control command signal
18	CFB	—	Phase compensation terminal
19	V_{CC}	I	Power supply terminal
20	ATFON	I	ATF ON terminal (Not used, connected to power supply)
21	PTBIA	—	Photo-transistor bias terminal (Not used, open)
22	VREF	O	Reference voltage terminal
23	LEDR 1	I	Bias voltage terminal
24	LEDH 1	—	Constant current terminal (Not used, open)
25	LEDR 2	I	Bias voltage terminal
26	LEDH 2	—	Constant current terminal (Not used, open)
27	CYL FG	O	Cylinder FG signal
28	CYF GSI	I	Cylinder schmidt comparator terminal
29	CYF GAO	O	Cylinder op. amp. terminal
30	CYF GAI	I	Cylinder op. amp. (−) terminal
31	NST BY	I	STAND BY signal (Not used, connected to power supply)
32	TF GAI	I	Take-up reel op. amp. (−) terminal
33	TF GAO	I	Take-up reel op. amp. terminal
34	TF GSI	I	Take-up reel schmidt comparator terminal
35	RLFGT	O	Take-up reel FG signal
36	RLFGS	O	Supply reel FG signal
37	SF GSI	I	Supply reel schmidt comparator terminal
38	SF GAO	O	Supply reel op. amp. terminal
39	SF GAI	I	Supply reel op. amp. terminal
40	V_{CC}	I	Power supply terminal
41	FG 2FI	—	Frequency characteristic setting terminal
42	FG 2AI	I	Capstan FG (−) signal
43	FG 2AO	O	Capstan FG signal
44	FG 2SI	I	Capstan FG schmidt comparator terminal
45	CPFG 2	O	Capstan FG signal
46	FILSLD	I	Frequency characteristic $\overline{\text{DOWN}}$ terminal
47	CPFG 1	O	Capstan FG signal
48	FG 1SI	I	Capstan FG schmidt comparator terminal

• IC271 (MN17541SDN2): Mechanism control

Pin No.	Mark	I/O Division	Function
1	NSBOA	O	Serial data signal
2	NRST	I	Reset signal
3	NSYNC	—	Not used, open
4	X 2		
5	X 1		
6	V_{SS}	—	GND terminal
7	OSC 2	—	Not used, open
8	OSC 1	I	Clock signal
9	V_{DD}	I	Power supply terminal
10	NTC1B	I	Supply reel FG signal

Pin No.	Mark	I/O Division	Function
11	NIRQ 0	I	Take-up reel FG signal
12	NIRQ 1	I	Transfer strobe signal of system control
13	P 00 (MSTB)		
14	P 01 (MRDY)	O	Transfer ready signal of system control
15	P 02 (NSSTB)	O	Transfer strobe signal
16	P 03 (NSRDY)	I	Transfer ready signal
17	P 10 (ATFGT)	O	ATF gain (X 1/2) select terminal
18	P 11 (REWGT)	O	REW FG · PG gain select terminal
19	P 12 (LPMOD)	—	Not used, open
20	P 13 (MODMT0)	O	Mode motor control signal
21	P 20 (MODMT1)		
22	P 21 (MODMT2)		
23	P 22	—	Not used, open
24	P 23 (PLG)	O	Plunger control signal
25	P 30	—	Not used, open
26	P 31		
27	P 32 (LOAD 1)	O	Tray motor control (+) terminal
28	P 33 (LOAD 2)	O	Tray motor control (−) terminal
29	P 40	—	Not used, open
30	P 41 (DEW)	I	Dew sensor det. signal
31	P 42 (EOT)	I	Tape end det. signal
32	P 43 (BOT)	I	Tape begin det. signal
33	P 50 (OPEN)	I	Cassette open det. signal
34	P 51 (CLOSE)	I	Cassette close det. signal
35	P 52 (LOAD S)	I	Loading start det. signal
36	P 53 (LOAD E)	I	Loading stop det. signal

Pin No.	Mark	I/O Division	Function
37	P 60 (SW 2)	O	Test terminal
38 ~ 40	P 61 (MMOD 0) ~ P 63 (MMOD 2)	I	Tape mode det. signal
41 ~ 44	P 70 (MBUS 0) ~ P 73 (MBUS 3)	I	Transfer bus terminal of system control
45	P 80 (RCC)	—	Not used, open
46	P 81 (FIL)	O	FILTER select signal
47	P82 (ATFON)	—	Not used, open
48	P 83 (NSTBY)	—	Not used, open
49	P 90 (NSRST)	O	Reset signal
50	P 91 (LEDDRV)	O	Tape begin/end LED control signal
51	P 92 (PCMOK)	I	PCM playback det. signal
52	P 93 (SVAL 0)	I	ATF effective position setting terminal
53	NEXPS	I	Not used, connected to power supply
54	PA 0 (NSNCOK)	I	ATF sync. det. terminal
55	PA 1 (NLNOK)	I	Track linearity det. terminal
56	PA 2 (CAPER)	I	Capstan rotative direction command signal
57	PA 3	—	Not used, open
58	PB 0 (TH 1)	I	Tape hall det. signal
59	PB 1 (TH 2)		
60	NSBTB	I	Muting det. signal
61	NSBIB	I	Test terminal
62	NSBOB		
63	NSBTA (SCLK)	I	Serial transfer clock signal
64	NSBIA (SDAT)	I/O	Serial transfer data signal

• IC301 (MN18P8321SDP): System control

Pin No.	Mark	I/O Division	Function
1	V_{CC}	I	Power supply terminal
2 ~ 9	P 67 (SPDT7) ~ P 60 (SPDT0)	I/O	Signal processor transfer address and data bus terminal
10	P 57 (SPRDY)	I	Signal processor data transfer command signal
11	P 56 (R3CP)	I	Frame sync. signal
12	P 55 (NGPIPLY)	I	GP1 pulse input (PLAY) (0: on 1: off)
13	P 54 (NGPIPAS)	I	GP1 pulse input (PAUSE) (0: on 1: off)
14	P 53 (UBITSKIN)	I	DIN U bit input (SK-ID) (1: yes)
15	P 52 (UBITSTIN)	I	DIN U bit input (SK-ID) (1: yes)
16	P 51 (NEXTSYNC)	I	Panel additional key (EXTSYNC) (0: on)
17	P 50 (NTIMEINP)	I	Panel additional key (TIME INPUT) (0: on)
18	EXI	I	Not used, connected to GND
19	EXO	O	Not used, open
20	NRST	I	Reset signal ("L": RESET)
21	P 47 (FLGDT)	O	Data signal of flag counter
22	P 46 (FLGCK)	O	Clock signal of flag counter
23	P 45 (DOUTTH)	O	Digital out through select ("H": through)
24	P 44 (DOUTDS)	O	Digital out select (1: DSP output)
25	P 43 (UNLOCK)	O	Digital-in PLL unlock signal (0: during detection)
26	P 42 (SLAD)	O	Digital-in PLL/crystal select ("L": PLL, "H": crystal)
27	P 41 (NDISCHG)	O	Digital-in PLL discharge terminal (0: discharge)
28	P 40 (WSYNCCHK)	O	FS check signal select (0: DIOLR 1: WSYNC)
29	P 27 (NPRDY)	I	Panel processor transfer terminal
30	OSC 1	I	Crystal OSC terminal (f=8 MHz)
31	OSC 2	O	
32	V_{SS}	—	GND terminal
33	XI (RRQ)	I	Transmission side interrupt request input (LOW-active)
34	XO	O	Not used, open
35	P 26 (TRQ)	I	Reception side interrupt request input (LOW-active)
36	P 25 (RFENV)	I	Envelope detection terminal
37	P 37 (DINPLINH)	O	Digital-in PLL prohibition signal ("H": prohibition)
38	P 36 (ALP0)	O	Address latch pulse 0
39	P 35 (ALP1)	O	Address latch pulse 1
40	P 34 (NCSNVRAM)	O	Chip select NVRAM (0: select)
41	P 33 (MSTB)	O	Transfer command terminal of mechanism control
42	P 32 (RST2)	O	Reset signal (1: Reset on)
43	P 31 (NRD)	O	Signal processor strobe signal
44	P 30 (NWR)	O	Signal processor address setting terminal
45	P 21 (HSW)	I	Head switching pulse signal
46	P 20 (NMRDY)	I	Transfer command signal from mechanism control
47	P 01 (IFTXD)	O	UART output (Not used, open) (for expanded microprocessor)
48	P 00 (IFRXD)	I	UART input (Not used, open) (for expanded microprocessor)
49	P 17 (PTXD)	O	Serial data transmission terminal
50	P 16 (PRXD)	I	Serial data reception terminal
51	P 15 (PCLK)	O	Serial data transmission/reception clock signal
52	P 14 (DINLOCK)	I	External PLL lock detection input (During lock: "H")
53	P 13 (MDT3)	I/O	Transfer data bus of mechanism control
54	P 12 (MDT2)		
55	P 11 (MDT1)	I/O	Transfer data bus of mechanism control
56	P 10 (MDT0)		
57	P 77 (DFDEMP)	O	Digital filter de-emphasis (1: on)
58	P 76 (DFMTG)	O	Digital filter mute (1: on)
59	P75 (LOMTG)	O	Line output mute (1: mute on)
60	P74 (HPMTG)	O	Headphones output mute (1: mute on)
61	P73 (ADCAL)	O	Reset signal (1: reset)
62	P72 (NDFMLE)	O	Digital filter mode set latch enable
63	P71 (DFMCK)	O	Digital filter mode set clock
64	P70 (DFMDT)	O	Digital filter mode set data

• IC302 (MN6624): Digital signal processor

Pin No.	Mark	I/O Division	Function
1	PCMCIF	O	Flag counter terminal
2	IDPP		
3	IDP	O	Test terminal
4	V_{DD}	I	Power supply terminal
5	TEST5	—	Not used, connected to GND
6	V_{SS}	—	GND terminal
7	CHIO FS	—	Not used, open
8	CHIO 128	O	Test terminal
9	CHIO 512	—	Not used, open
10	NDALOAD	—	Not used, open
11	DADAT	O	DA data signal
12	DALRCK	O	LR discrimination signal
13	DABCK	O	Serial bit clock signal
14	DAMCK	—	Not used, open
15	V_{DD}	I	Power supply terminal
16	TEST 6	—	Not used, open
17	V_{SS}	—	GND terminal
18	ADDAT	I	AD data signal
19	ADLRCK	O	LR discrimination signal
20	ADBCK	O	Serial bit clock signal
21	ADMCK	O	External clock signal
22	TX	O	Digital signal
23	RX	I	
24	VCOS L32	—	Not used, open
25	VCOS L44		
26	VCOS L48		
27	DIO REF	O	Digital signal (PLL control)
28	DIO VAR	O	
29	V_{DD}	I	Power supply terminal
30	DI 512	I	Digital signal (512 FS)
31	V_{SS}	—	GND terminal
32	XO 4	—	Not used, open
33	XI 4	I	Crystal terminal (32 kHz×512)

Pin No.	Mark	I/O Division	Function
34	TEST 0	—	Not used, connected to GND
35	XO 3	—	Not used, open
36	XI 3	I	Crystal terminal (44.1 kHz×512)
37	TEST 1	—	Not used, connected to GND
38	XO 2	—	Not used, open
39	XI 2	I	Crystal terminal (48 kHz×512)
40	V_{DD}	I	Power supply terminal
41	XO 1	O	Crystal OSC terminal
42	XI 1	I	
43	V_{SS}	—	GND terminal
44	PC OUT	—	Not used, open
45	RAD 0	O	RAM address bus terminal
46	RAD 1		
47	RAD 2		
48	RAD 3		
49	RAD 4		
50	RAD 5		
51	RAD 6		
52	RAD 7		
53	V_{DD}	I	Power supply terminal
54	TEST 2	—	Not used, connected to GND
55	V_{SS}	—	GND terminal
56	RAD C	O	RAM address bus terminal
57	RAD E		
58	NWE	O	Write enable for memory
59	RAD D	O	RAM address bus terminal
60	RAD 8		
61	RAD 9		
62	RAD B		
63	NOE	O	Output enable for memory
64	RAD A	O	RAM address bus terminal
65	V_{DD}	I	Power supply terminal
66	NCS	O	Chip select terminal for memory

Pin No.	Mark	I/O Division	Function
67	V_{SS}	—	GND terminal
68	RDT 7	I/O	RAM data bus terminal
69	RDT 6		
70	RDT 5		
71	RDT 4		
72	RDT 3		
73	RDT 2		
74	RDT 1		
75	RDT 0		
76	V_{SS}	—	GND terminal
77	TEST 3	—	Not used, connected to GND
78	V_{DD}	I	Power supply terminal
79	SPDT 7	I/O	Address and data bus terminal
80	SPDT 6		
81	SPDT 5		
82	SPDT 4		
83	SPDT 3		
84	SPDT 2		
85	SPDT 1		
86	SPDT 0		
87	V_{SS}	—	GND terminal
88	TEST 4	—	Not used, connected to GND
89	V_{DD}	I	Power supply terminal
90	SPAW	I	Signal processor address setting terminal
91	SPSTB	I	Signal processor strobe signal
92	SPRDY	O	Data transfer command signal
93	UNLOK	O	PLL unlock signal
94	DISYND	—	Not used, open
95	NSTBY	I	Not used, connected to power supply

Pin No.	Mark	I/O Division	Function
96	NRST	I	Reset signal
97	M7CK	—	Master clock signal (Not used, open)
98	R6CP/(ENVT)	O	Timing signal for RF envelope signal control
99	R3CP		
100	V_{SS}	—	GND terminal
101	SRRF	O	Recording signal
102	V_{DD}	I	Power supply terminal
103	SRPR	O	Recording/playback select signal (REC: "H", PLAY: "L")
104	SRWND 2	O	ATF area det. signal
105	SRWND 1	O	Track pitch signal
106	PBDT	I	Playback signal
107	PBCK	I	Playback envelope signal
108	RFMSK	O	Not used, open
109	PLLOFS	O	PLL off-set information signal
110	HFCH	O	System clock signal
111	VFPLFS	O	PLL OFS effective information signal
112	EXFCH	—	Not used, connected to GND
113	EEMD	—	Not used, connected to GND
114	V_{SS}	—	GND terminal
115	SL NRZI	—	Not used, connected to GND
116	SELF CH0		
117	SELF CH1	—	Not used, connected to GND
118	V_{DD}	I	Power supply terminal
119	M9CP	O	Master clock signal
120	HSW	I	Head switching signal
121	NR TRST	—	Not used, connected to power supply
122	SUBWND	—	Not used, open
123	IPF	O	Output terminal for flag counter
124	SUBC 1		

• IC303 (MN53040VPS): Memory control

Pin No.	Mark	I/O Division	Function
1	V_{SS}	I	GND terminal
2	OLP	O	Memory parallel output data latch pulse
3	NRAS	O	Low address strobe signal
4	NCASL	O	Column address strobe signal (L ch)
5	NCASR	O	Column address strobe signal (R ch)
6	NWEL	O	Write eneble signal (L ch)
7	NWER	O	Write eneble signal (R ch)
8	NOE	O	SP conversion output enable signal
9	ADR0	O	DRAM address bus BIT0 (LSB)
10	V_{DD}	I	5 V power supply
11	ADR1	O	DRAM address bus BIT1
12	V_{SS}	I	GND terminal
13 ≀ 20	ADR2 ≀ ADR9	O	DRAM address bus BIT2~9
21	V_{SS}	I	GND terminal
22	V_{DD}	I	5 V power supply
23	TMRD	O	Trim memory read signal
24	INTL	O	L ch interrupt signal
25	INTR	O	R ch interrupt signal
26	SPA0	I	DSP address bus BIT0
27	SPA1	I	DSP address bus BIT1
28	NSPRW	I	DSP read write signal
29	NSPSTB	I	DSP strobe signal
30	NSPIS	I	DSP interrupt signal
31	V_{SS}	I	GND terminal
32	BCK	I	Bit clock D-VTR=64 Fs
33	V_{DD}	I	5 V power supply
34 ≀ 41	SPD0 ≀ SPD7	O	DSP data bus BIT0~7
42	RDRQ	I	JOG data read request signal
43	MUTE	O	Mute signal
44 ≀ 47	TMODE1 ≀ TMODE4	I	Test mode input 1~4: Normal L

Pin No.	Mark	I/O Division	Function
48 ≀ 50	MSEL0 ≀ MSEL2	I	Flexible RAM select signal
51	MTEST	O	Select signal during memory test
52	V_{SS}	I	GND terminal
53	REFO	I	Memory test reference data
54	V_{DD}	I	5 V power supply
55	RAMD	I	Memory output data (PS output): Used during memory test
56	TSTD	O	Memory test data (BCK 1/2 divide data)
57	CMPFLG	O	Cross fade start timing in synch mode H: start
58	SIGPAS	O	Memory bypass select signal L: memory H: direct
59	MCK	I	Internal processor master clock MCK=32 Fs
60	NMODE	O	Test mode output 0: normal state 1: test mode state (GA test)
61	LRCK	I	FS word clock (duty cycle = 50:50)
62	LRCKN	I	Memory JOG word clock (I/N divide) This clock is connected to LRCK when not in use.
63	FIELD	I	Frame/field reference clock
64 ≀ 71	MPD0 ≀ MPD7	I/O	System microprocessor data bus BIT0 (LSB)~7 (MSB)
72	TMCS	I	Trim memory LSI select signal
73	V_{DD}	I	5 V power supply
74	NRST	I	Trim memory LSI reset signal L: reset
75	V_{SS}	I	GND terminal
76	NMPWR	I	System microprocessor write pulse input
77	NMPRD	I	System microprocessor read pulse input
78 ≀ 81	MPA0 ≀ MPA3	I	System microprocessor address bus BIT0~3
82	NC	—	Not used, open
83	MDOWR	O	Output data latch pulse from DSP (16 bit data)
84	V_{DD}	I	5 V power supply

• IC304 (MN56100SDS): Time code/clock generator

Pin No.	Mark	I/O Division	Function
1	V_{SS}	I	GND terminal
2	VSYNC	I	External VIDEO SYNC signal input
3	FILMI	I	Film pulse input with square H wave at 24 Hz
4	P1VI	I	VCO oscillation input for PLL1
5	P1SEL	I	PLL1 phase comparison input select 0: RC filter 1: active filter
6	PL1PP	O	PLL1 lock decision output 0: unlock 1: lock
7	P1PD	O	PLL1 phase comparison output
8	V_{SS}	I	GND terminal
9	WSYNC	I	External WORD SYNC signal input
10	DIFS	I	LRCK input during DIN
11	DILOCK	I	Plug input for LRCK input during DIN 0: invalid 1: valid
12	P2VI	I	VCO oscillator input for PLL2
13	P2SEL	I	PLL2 phase comparison input select 0: RC filter 1: active filter
14	PL2PP	O	PLL2 lock decision output 0: unlock 1: lock
15	P2PD	O	PLL2 phase comparison output
16	V_{DD}	I	5 V power supply
17	P3VI	I	VCO oscillator input for PLL3
18	P3SEL	I	PLL3 phase comparison input select 0: RC filter 1: active filter
19	PL3PP	O	PLL3 lock decision output 0: unlock 1: lock
20	P3PD	O	PLL3 phase comparison output
21	V_{SS}	I	GND terminal
22	V_{DD}	I	5 V power supply
23	P4PD	O	PLL4 phase comparison output
24	PL4PP	O	PLL4 lock decision output 0: unlock 1: lock
25	P4SEL	I	PLL4 phase comparison input select 0: RC filter 1: active filter
26	P4VI	I	VCO oscillator input for PLL4
27	P5SEL	I	PLL5 phase comparison input select 0: RC filter 1: active filter
28	P5VI	I	VCO oscillator input for PLL5
29	PL5PP	O	PLL5 lock decision output 0: unlock 1: lock
30	P5PD	O	PLL5 phase comparison output

Pin No.	Mark	I/O Division	Function
31	V_{SS}	I	GND terminal
32	TEST1	I/O	Test I/O
33	V_{DD}	I	5 V power supply
34	TEST2	I/O	Test I/O
35	FCH	O	FCH master clock
36	IFS2	O	96 kHz output
37	CKMST	O	512 Fs or 256 Fs
38	C18MOUT	O	FCH master clock
39	NROTRST	O	DAT frame reset pulse output
40	LRCK	I	LRCK input
41	R3CP	I	DAT frame signal input
42	V_{DD}	I	5 V power supply
43	V_{SS}	I	GND terminal
44	X14I	I	Crystal input at 14.112 MHz
45	X14O	O	Crystal output at 14.112 MHz
46	V_{SS}	I	GND terminal
47	C9K6IN	I	Synchronize input from external synch source 9.6 kHz square wave
48	X9I	I	Crystal input at 9.8304 MHz
49	X9O	O	Crystal output at 9.8304 MHz
50	V_{SS}	I	GND terminal
51	XFREI	I	Free run timer master clock input
52	XFREO	O	Free run timer master clock output
53	TCTEST	I	Time code block test mode set terminal Normal: Lo
54	CKTEST	I	Clock block test mode set terminal Normal: Lo
55	TCIN	I	Time code input 0-5 V
56	TCOUT	O	Time code output 0-5 V
57 ~ 62	A5 ~ A0	I	Address bus 5~0
63	V_{SS}	I	GND terminal
64	V_{DD}	I	5 V power supply
65 ~ 72	D7 ~ D0	I/O	Data bus 7~0

Pin No.	Mark	I/O Division	Function
73	V_{DD}	I	5 V power supply
74	RST	I	Reset input 0: normal 1: reset
75	V_{SS}	I	GND terminal
76	NWR	I	Write signal
77	NRD	I	Read signal
78	CS	I	Chip select
79	TCRIRQ	O	Interrupt request signal with DAT frame edge

Pin No.	Mark	I/O Division	Function
80	TCGIRQ	O	Interrupt request signal with video frame reference
81	SELFS1	O	Fs mode select
82	SELFS0	O	Fs mode select
83	NBACK	I	Backup mode set terminal 1: normal 0: backup
84	V_{DD}	I	5 V power supply

• IC305 (L7A0541): Gate array

Pin No.	Mark	I/O Division	Function
1	TEST1	I	Test mode
2	TEST2	I	Test mode
3	DINLOCK	O	External PLL lock detection output During lock: H
4	RXBCK	O	Reception PCM sound bit clock output
5	RXPCM	O	Reception PCM sound output
6	RXLRCK	O	Reception PCM sound L/R ch indentification output Fs
7	RXVFLG	O	Reception V flag output
8	RXWCK	O	Reception PCM sound word clock output
9	RXBLK	O	Reception signal block detection output
10	ODF0	I	Reception PCM sound output format set input
11	ODF1	I	Reception PCM sound output format set input
12	V_{DD}	I	5 V power supply
13	V_{SS}	I	GND terminal
14	TXMCK	I	Transmission master clock input 128 Fs
15	NC	—	Not used, open
16	TXBCK	I	Transmission PCM sound bit clock input
17	TXPCM	I	Transmission PCM sound input
18	TXLRCK	I	Transmission PCM sound L/R ch indentification input Fs
19	TXVFLG	I	Transmission V flag input
20	BLKIN	I	Transmission block sync input

Pin No.	Mark	I/O Division	Function
21	IDF0	I	Transmission PCM sound input format set input
22	IDF1	I	Transmission PCM sound input format set input
23	CRCON	I	C bit CRC set and select input
24	TRESET	I	Initialize pulse input
25	CRCOUT	O	Reception C bit CRC check output
26	PTYOUT	O	Reception parity check output
27	RXUBIT	O	Reception U bit output
28	RXCBIT	O	Reception C bit output
29	NC	—	Not used, open
30	TSDATA	O	Reception C bit serial communications data output
31	TSCK	I	Reception C bit serial communications clock input
32	V_{SS}	I	GND terminal
33	V_{DD}	I	5 V power supply
34	RSCK	I	Transmission C bit serial communications clock input
35	RSDATA	I	Transmission C bit serial communications data input
36	CDRCT	I	Transmission C bit select input Serial communication: L
37	TXUBIT	I	Transmission U bit input
38	TXCBIT	I	Transmission C bit input
39	UPS	I	Transmission U bit select input Parallel communication: H
40	CPS	I	Transmission C bit select input Parallel communication: H

Pin No.	Mark	I/O Division	Function
41	RRQ	I	Transmission side interrupt request input Low-active
42	TRQ	I	Reception side interrupt request input Low-active
43 ≀ 50	DB0 ≀ DB7	I	Parallel communications data bus
51	WE	I	Parallel communications WE pulse input
52	CS	I	Parallel communications CS input
53	V_{SS}	I	GND terminal
54	V_{DD}	I	5 V power supply
55	LRCON	I	Parallel communications L/R control input
56	IO	I	Parallel communications I/O select input During input: H
57 ≀ 63	AB0 ≀ AB6	I	Parallel communications address bus
64	TXBLK	O	Transmission signal block detection output
65	NC	—	Not used, open

Pin No.	Mark	I/O Division	Function
66	TX	O	Digital interface transmission signal output
67	NC	—	Not used, open
68	NC	—	Not used, open
69	RX	I	Digital interface reception signal input
70	MSEL	I	External PLL clock frequency select input
71	DICK	I	External PLL clock input
72	V_{SS}	I	GND terminal
73	V_{DD}	I	5 V power supply
74	DISCHG	O	External PLL trigger output
75	NC	—	Not used, open
76	VAR	O	External PLL sink current output Low-active
77	NC	—	Not used, open
78	REF	O	External PLL soure current output High-active
79	NC	—	Not used, open
80	TSTOUT	O	Test signal output

• IC405 (CS5339-KP): A/D converter

Pin No.	Mark	I/O Division	Function
1	A. GND	—	Analog GND terminal
2	AINL	I	Analog data (L ch) signal
3	ZEROL	—	Not used, connected to GND
4	VA+	I	Power supply terminal (+)
5	VA−	I	Power supply terminal (−)
6	APD	I	Reset signal
7	ACAL	—	Not used, connected to GND
8	NC	—	Not used, open
9	DCAL	O	Relay control terminal
10	DPO	I	Reset sihnal
11	TST	—	Not used, connected to GND
12	CMODE	—	Not used, connected to GND
13	SMODE	—	Not used, connected to GND
14	L/R	I/O	L/R discrimination signal

Pin No.	Mark	I/O Division	Function
15	SCLK	I/O	Serial bit clock output terminal
16	SDATA	O	Digital data signal
17	FSYNC	I	Not used, connected to power supply
18	VD+	I	Power supply terminal
19	D. GND	—	Digital GND terminal
20	CLK	I	Clock input terminal
21	OCLK	O	Clock output terminal
22	NC	—	Not used, open
23	ICLK	I	Clock input terminal
24	LGND	—	GND terminal
25	VL+	I	Power supply terminal (+)
26	ZEROR	—	Not used, connected to GND
27	AINR	I	Analog data (R ch) signal
28	VREF	O	Reference voltage terminal

• IC406 (SM5843AP): Digital filter

Pin No.	Mark	I/O Division	Function
1	DI/$\overline{\text{INF2}}$	I	Input data (INF1N: "L") Input format select 2 (INF1N: "H")
2	BCKI	I	Serial bit clock input terminal
3	$\overline{\text{CKSL}}$	I	Clock input frequency select terminal ("H": 384 fs, "L": 256 fs)
4	$\overline{\text{INF1}}$	I	Input format select 1
5	$\overline{\text{IW1}}$/DIL	I	Input bit select 1 (INF1N: "L") L ch data input (INF1N: "H")
6	XTI	I	Clock input terminal
7	XTO	O	Clock output terminal
8	V_{SS}	—	GND terminal
9	CKO	O	Clock output terminal
10	$\overline{\text{IW2}}$/DIR	I	Input bit select 2 (INF1N: "L") R ch data input (INF1N: "H")
11	MDT	I	Attenuation command serial data input terminal
12	MCK	I	Attenuation command bit clock input terminal
13	$\overline{\text{MLE}}$	I	Attenuation command latch clock input terminal
14	$\overline{\text{RST}}$	I	System reset terminal ("L": Active)
15	MUTE	I	Muting control terminal ("H": Mute)
16	DEMP	I	Digital de-emphasis ON/OFF ("H": ON)
17	FSEL1	I	De-emphasis filter select terminal
18	FSEL2		
19	$\overline{\text{OW20}}$	I	Output bit select terminal ("H": 18 bit, "L": 20 bit)
20	$\overline{\text{SYNC}}$	I	Synchronizing mode select ("L": Forced mode, "H": Jitter free mode)
21	NC	—	No connected, open
22	V_{DD}	I	Power supply terminal
23	DOR	O	R ch data output
24	DOL	O	L ch data output
25	WCKO	O	Word clock output
26	BCKO	O	Serial bit clock output terminal
27	TMOD	I	Filter response select ("H": Response 1, "L": Response 2)
28	LRCI	I	Sample rate (fs) clock signal

fs (Hz)	32 k	44.1 k	48 k	Test
FSEL1	H	L	L	H
FSEL2	H	L	H	L

• IC407, 408 (PCM1702P): D/A converter

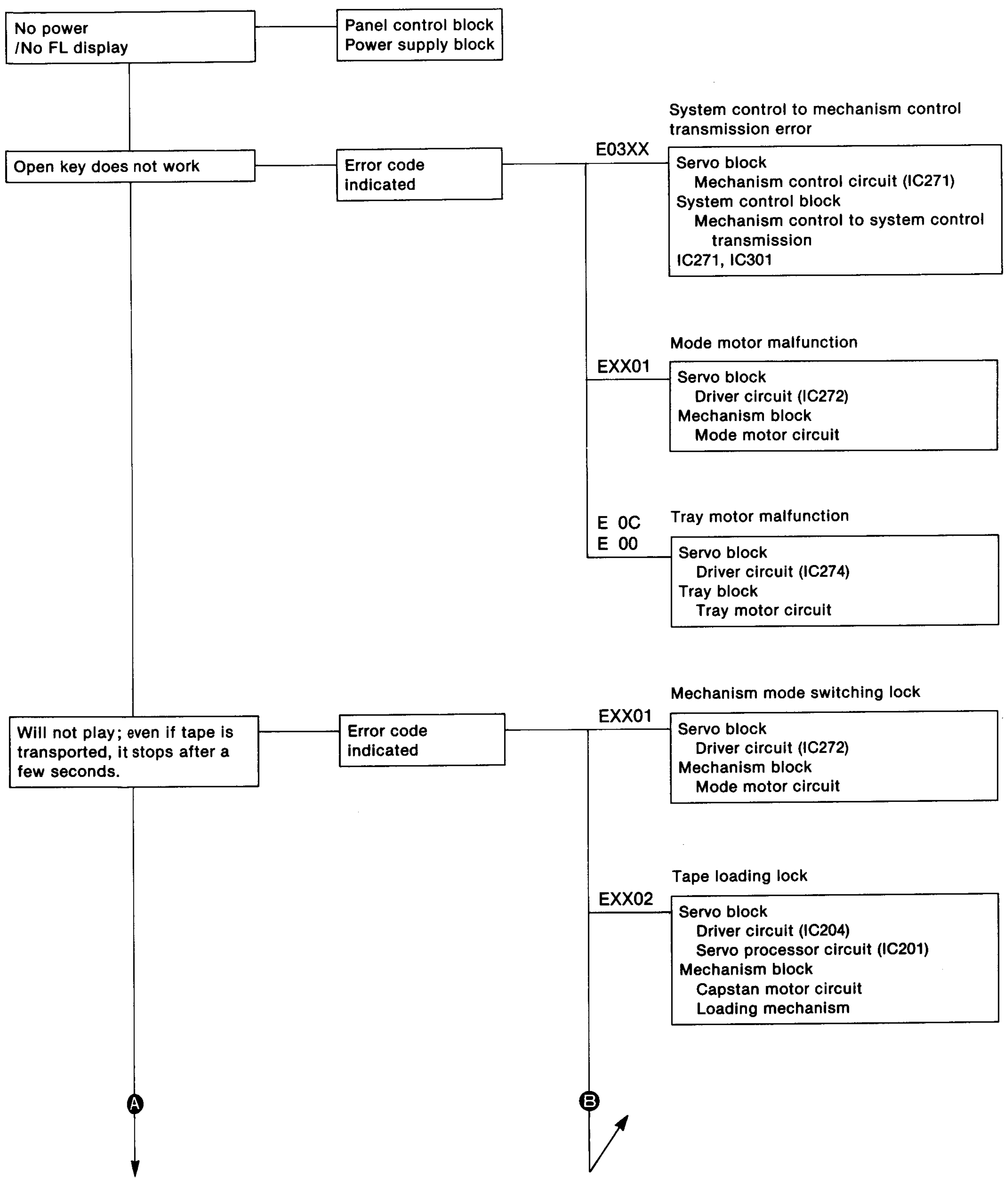
Pin No.	Mark	I/O Division	Function
1	DATA	I	Serial data
2	CLOCK	I	Bit clock
3	$+V_{DD}$	I	Digital +5 V power supply
4	DGND	I	Digital GND terminal
5	$-V_{DD}$	I	Digital −5 V power supply
6	LE	I	Latch enable
7	NC	—	Reserved
8	NC	—	Reserved
9	$+V_{CC}$	I	Analog +5 V power supply
10	BPO DC	I/O	Bpo decoupple
11	IOUT	O	Current out
12	AGND	I	Analog GND terminal
13	AGND	I	Analog GND terminal
14	SERV	I/O	Servo decoupple
15	REF	I/O	Ref decoupple
16	$-V_{CC}$	I	Analog −5 V power supply

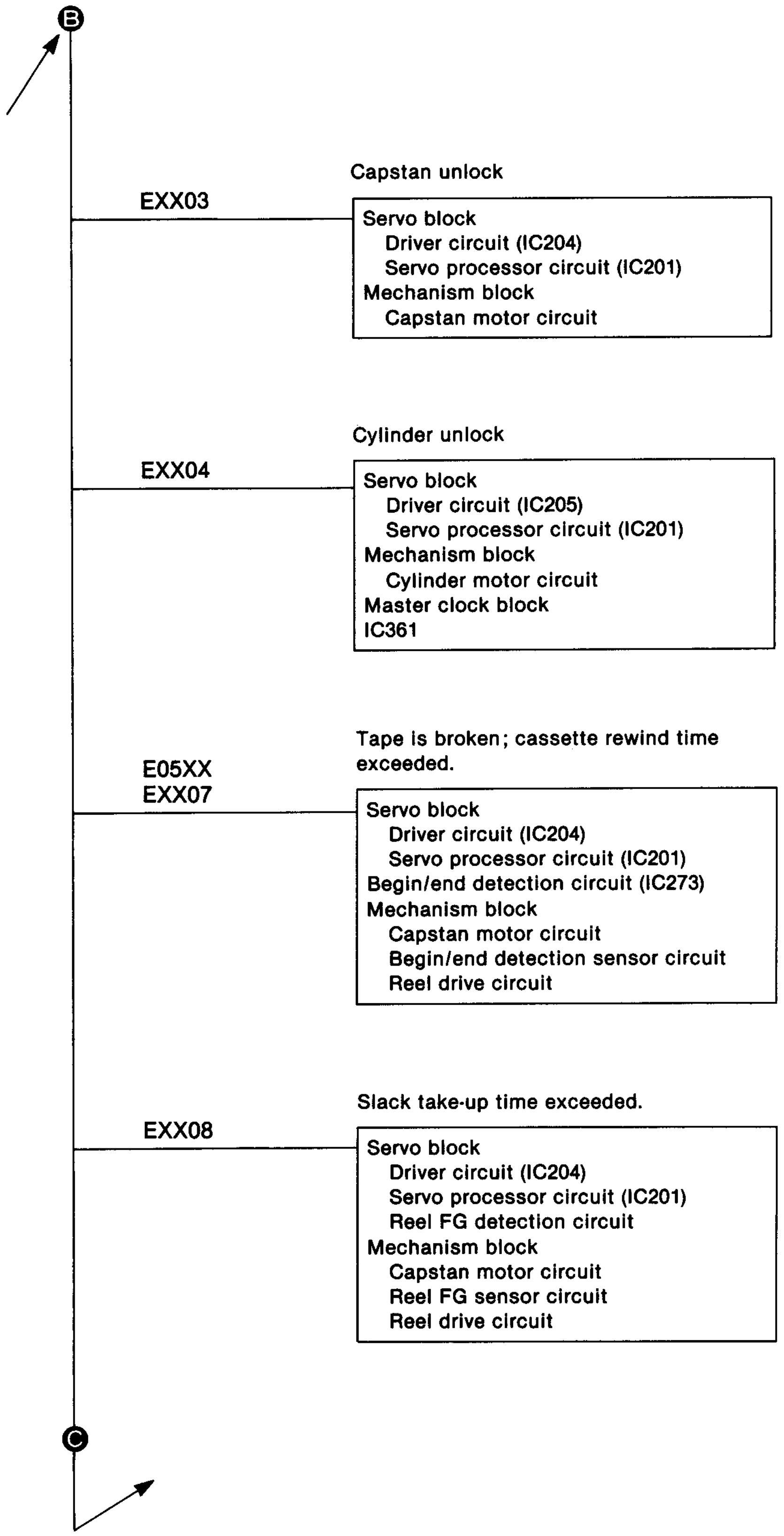
• IC601 (M50754-165FP): Panel control & FL drive

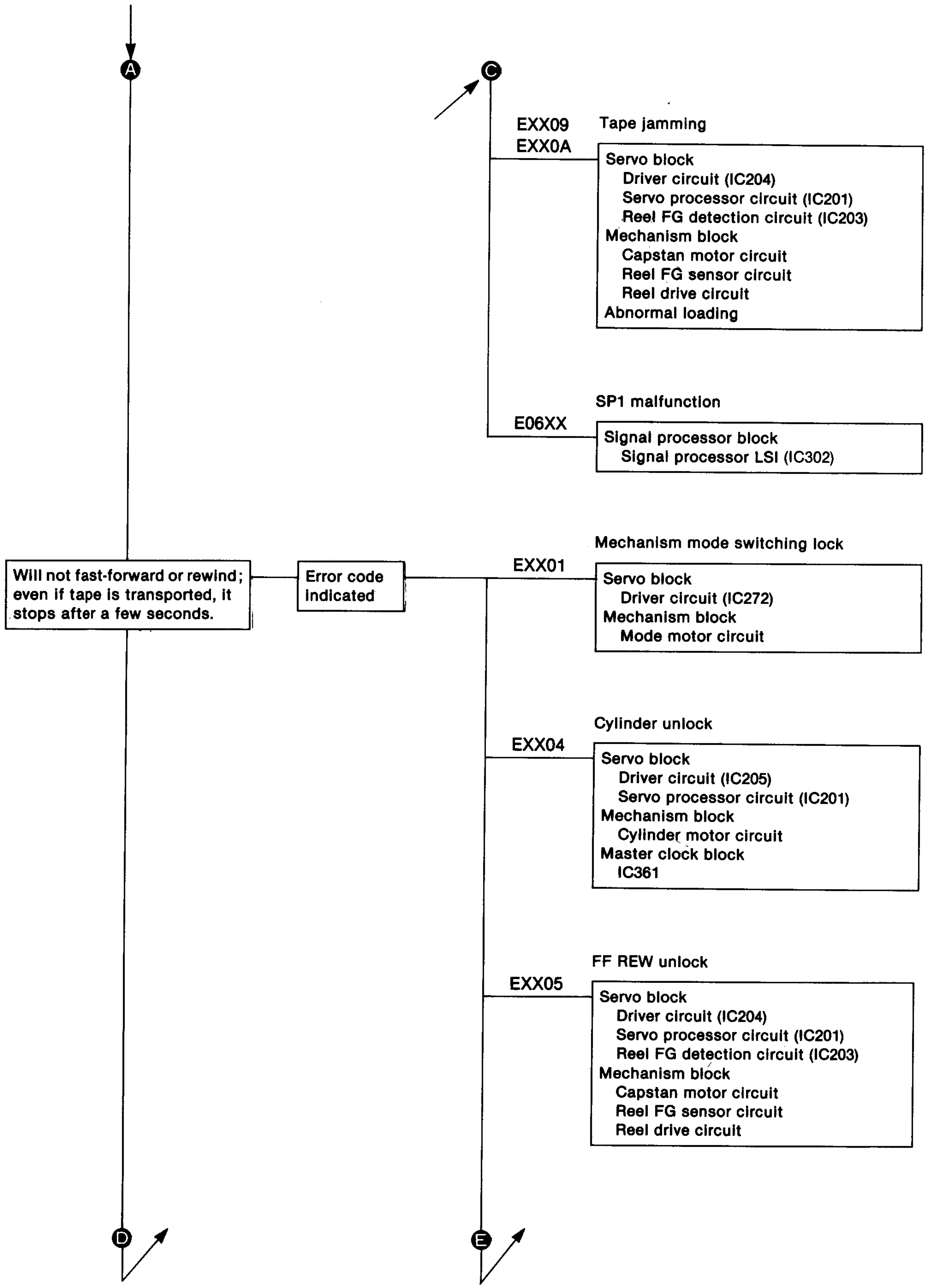
Pin No.	Mark	I/O Division	Function
1	V_{SS}	—	GND terminal
2	P 27	O	Input select signal (DIGITAL ↔ ANALOG)
3	P 26	O	LED display drive terminal (PAUSE)
4	P 25	O	LED display drive terminal (REC)
5	P 24	O	LED display drive terminal (PLAY)
6 ≀ 8	P 23 ≀ P 21	I	Key return signal
9	P 20	O	Buffer control signal
10	NC	—	Not connection
11	NPRDY	O	Ready signal
12	NTRCLK	I/O	Serial data transmission/reception clock signal
13	RXD	O	Serial data transmission signal
14	TXD	I	Serial data reception signal
15	P 33	O	Not connection
16	P 32	—	
17	P 31	O	LED display drive terminal (S. PLAY)
18	P 30	O	LED display drive terminal (A. PNO)
19	INT 1	I	Remote control signal
20	INT 2	I	Not used, connected to power supply
21	CNV_{SS}	—	GND terminal
22	RST	I	Reset signal ("L": RESET)
23	NC	—	Not connection
24	X IN	I	Master clock terminal (6 MHz)
25	X OUT	O	
26	NC	—	Not connection
27	X CIN	—	Not used, connected to GND
28	X COUT	—	Not used, open
29	V_{SS}	—	GND terminal
30	NC	—	Not connection
31	P 57	I	Key return signal
32	P 56		
33	P 55		
34	P 54		

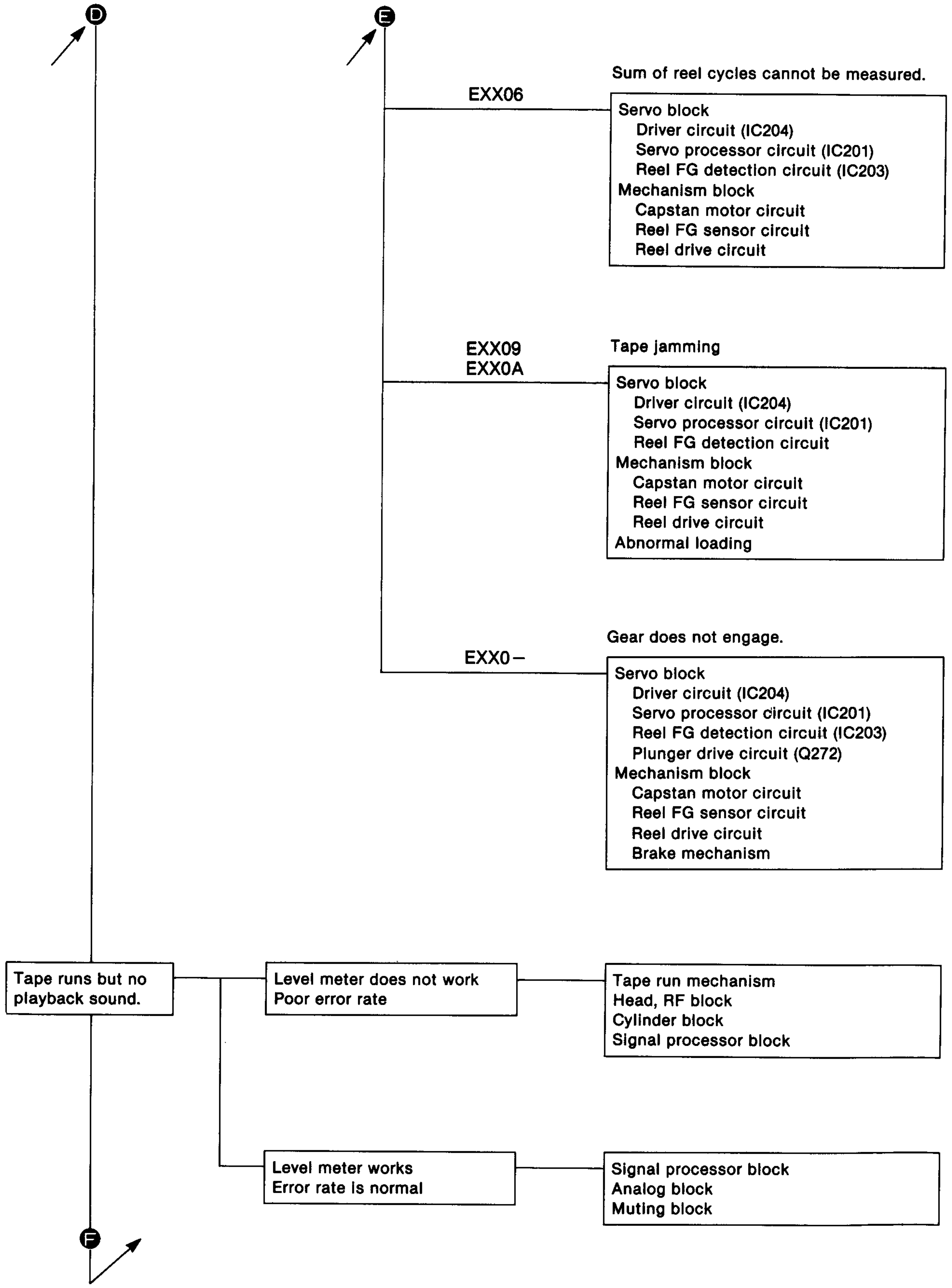
Pin No.	Mark	I/O Division	Function
35	VP	I	Power supply terminal for FL drive
36	P 51	O	Segment signal for FL drive
37	P 50		
38 ≀ 45	P 17 ≀ P 10		
46	NC	—	Not connection
47	P 07	O	Segment signal for FL drive
48	P 06		
49	P 05		
50	P 04		
51	P 03		
52	P 02		
53	P 01		
54	P 00		
55	P 47		
56	P 46		
57	P 45		
58	P 44		
59	P 43		
60	P 42		
61	P 41		
62	P 40		
63	V_{CC}	I	Power supply terminal
64	V_{CC}		
65	V_{SS}	—	GND terminal
66	P 65	O	Digit signal for FL drive and key scan signal
67	P 64		
68	P 63		
69	P 62		
70	P 61		
71	P 60		
72	NC	—	Not connection

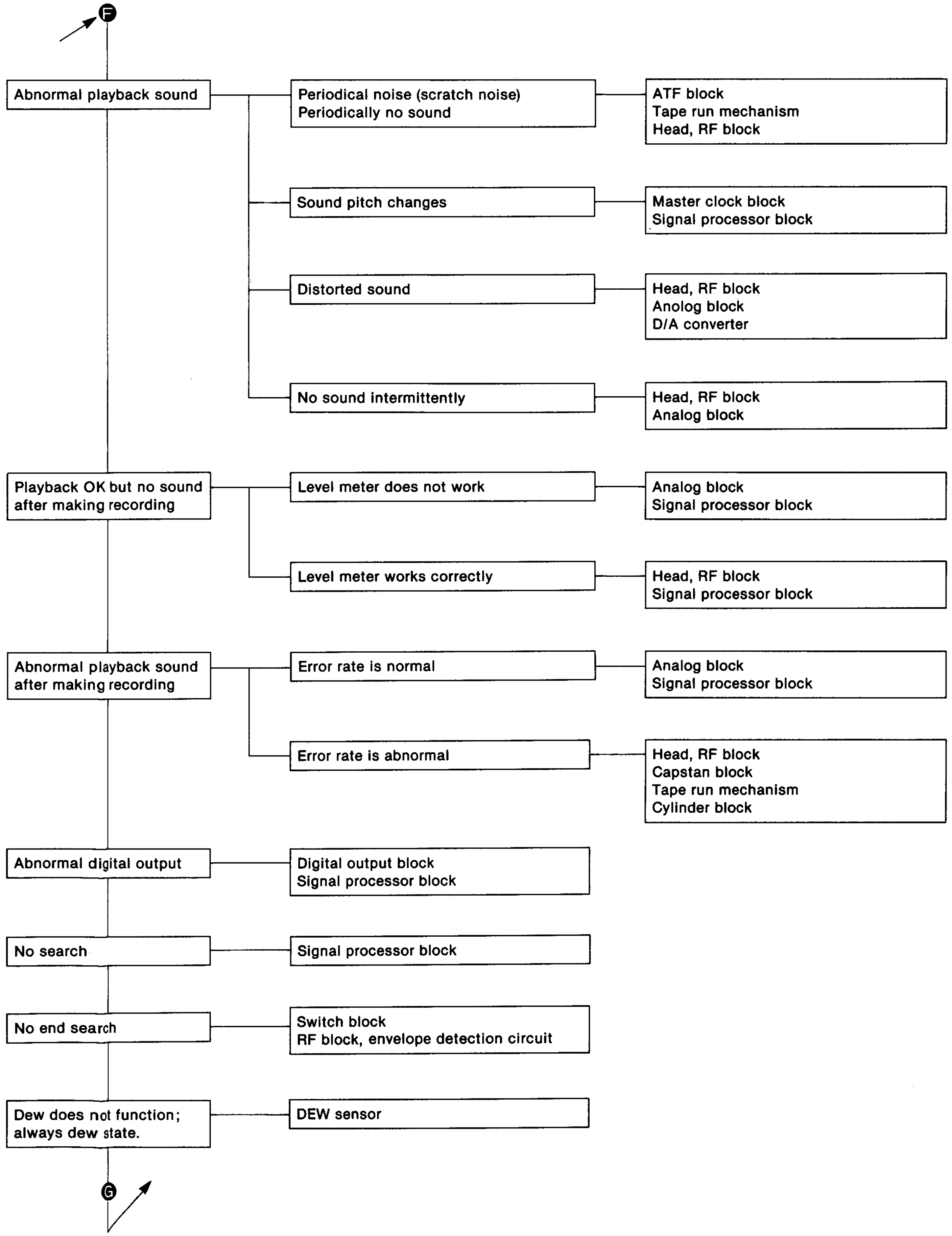
■TROUBLESHOOTING

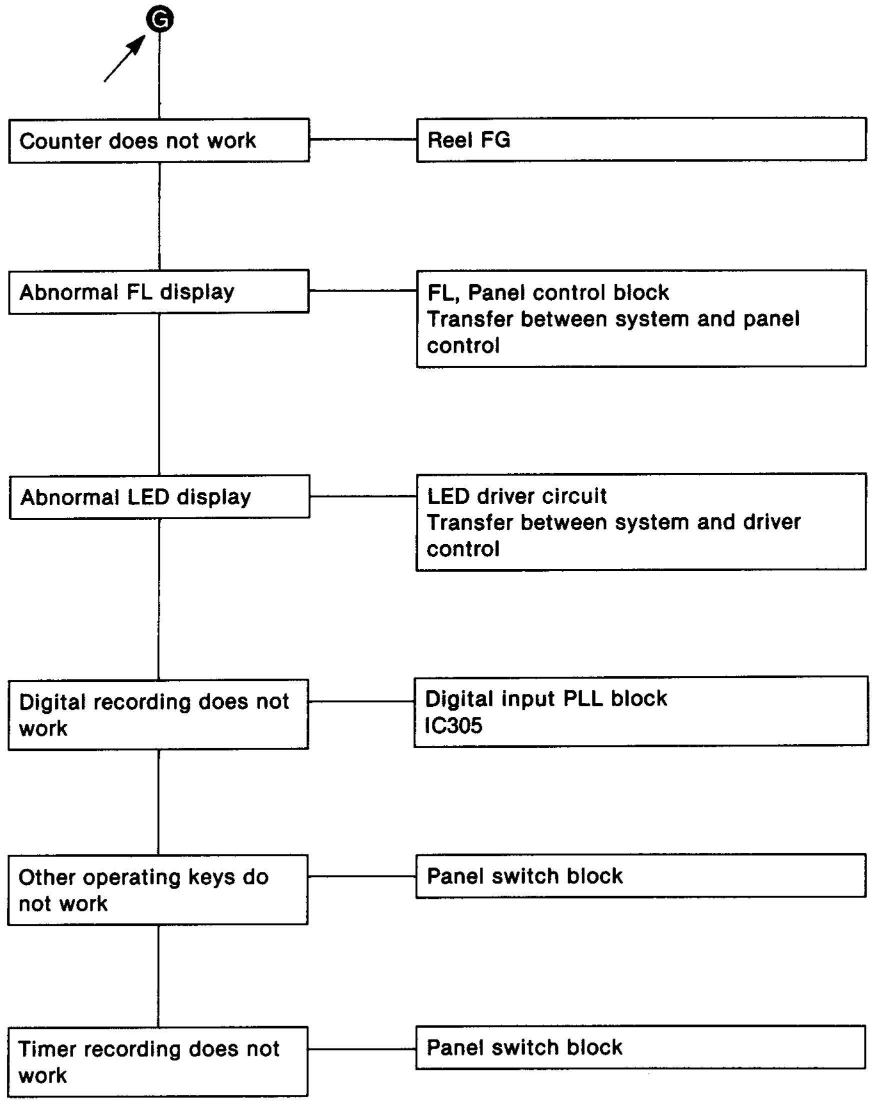

No power
/No FL display
Panel control block
Power supply block
Open key does not work
Error code indicated
E03XX
System control to mechanism control transmission error
Servo block
Mechanism control circuit (IC271)
System control block
Mechanism control to system control transmission
IC271, IC301
EXX01
Mode motor malfunction
Servo block
Driver circuit (IC272)
Mechanism block
Mode motor circuit
E 0C
E 00
Tray motor malfunction
Servo block
Driver circuit (IC274)
Tray block
Tray motor circuit
Will not play; even if tape is transported, it stops after a few seconds.
Error code indicated
EXX01
Mechanism mode switching lock
Servo block
Driver circuit (IC272)
Mechanism block
Mode motor circuit
EXX02
Tape loading lock
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Mechanism block
Capstan motor circuit
Loading mechanism
A
B


B
EXX03
Capstan unlock
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Mechanism block
Capstan motor circuit
EXX04
Cylinder unlock
Servo block
Driver circuit (IC205)
Servo processor circuit (IC201)
Mechanism block
Cylinder motor circuit
Master clock block
IC361
E05XX
EXX07
Tape is broken; cassette rewind time exceeded.
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Begin/end detection circuit (IC273)
Mechanism block
Capstan motor circuit
Begin/end detection sensor circuit
Reel drive circuit
EXX08
Slack take-up time exceeded.
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
C


A
C
EXX09
EXX0A
Tape jamming
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
Abnormal loading
E06XX
SP1 malfunction
Signal processor block
Signal processor LSI (IC302)
Will not fast-forward or rewind; even if tape is transported, it stops after a few seconds.
Error code indicated
EXX01
Mechanism mode switching lock
Servo block
Driver circuit (IC272)
Mechanism block
Mode motor circuit
EXX04
Cylinder unlock
Servo block
Driver circuit (IC205)
Servo processor circuit (IC201)
Mechanism block
Cylinder motor circuit
Master clock block
IC361
EXX05
FF REW unlock
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
D
E


D
E
EXX06
Sum of reel cycles cannot be measured.
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
EXX09
EXX0A
Tape jamming
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
Abnormal loading
EXX0 –
Gear does not engage.
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Plunger drive circuit (Q272)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
Brake mechanism
Tape runs but no playback sound.
Level meter does not work
Poor error rate
Tape run mechanism
Head, RF block
Cylinder block
Signal processor block
Level meter works
Error rate is normal
Signal processor block
Analog block
Muting block
F


F
Abnormal playback sound
Periodical noise (scratch noise)
Periodically no sound
ATF block
Tape run mechanism
Head, RF block
Sound pitch changes
Master clock block
Signal processor block
Distorted sound
Head, RF block
Anolog block
D/A converter
No sound intermittently
Head, RF block
Analog block
Playback OK but no sound after making recording
Level meter does not work
Analog block
Signal processor block
Level meter works correctly
Head, RF block
Signal processor block
Abnormal playback sound after making recording
Error rate is normal
Analog block
Signal processor block
Error rate is abnormal
Head, RF block
Capstan block
Tape run mechanism
Cylinder block
Abnormal digital output
Digital output block
Signal processor block
No search
Signal processor block
No end search
Switch block
RF block, envelope detection circuit
Dew does not function; always dew state.
DEW sensor
G


G
Counter does not work
Reel FG
Abnormal FL display
FL, Panel control block
Transfer between system and panel control
Abnormal LED display
LED driver circuit
Transfer between system and driver control
Digital recording does not work
Digital input PLL block
IC305
Other operating keys do not work
Panel switch block
Timer recording does not work
Panel switch block

KEY POINTS FOR TROUBLESHOOTING

- Mechanism block
  - Loading mechanism
    - Post roller
    - Tension regulator
    - Pinch roller
    - Brake lever
  - Brake mechanism
    - Brake lever
    - Solenoid
    - Solenoid driver
  - Mechanism switch block
    - Tape hole detection switch
    - Cassette detection switch
    - Holder switch
  - Reel FG block
    - Detection photo transistor
    - Detection LED
    - Reel FG amp (servo P.C.B.)
  - FPC & FPC connector

- Mode motor block
  - Mode motor
  - Mode switch
  - Mode motor driver circuit

- Master clock block
  - 28 MHz oscillator
  - 16 MHz, 22 MHz, 24 MHz oscillate and select circuit

- Panel switch block
  - Switch
  - Panel control IC

- Head, RF block
  - Head FPC & FPC connector
  - Head dirty
  - Head cracked or damaged
  - RF recording current
  - Playback eye pattern

- Tape begin/end detection block
  - Begin/end detection photo transistor
  - Begin/end detection LED
  - Comparator circuit
  - FPC & FPC connector

- Power supply block
  - Power supply regulator output
  - Fuse

- Capstan block
  - Capstan FG
  - FG amp
  - Motor driver output
  - Motor current

- Cylinder block
  - Cylinder FG
  - Cylinder PG
  - FG amp
  - PG amp
  - Motor driver output
  - Motor current

- ATF block
  - RF ATF output
    - ATF SYNC output
  - ATF select circuit
  - ATF gate allay

- Signal processor block
  - Data & clock to D/A
  - Data & clock to A/D
  - All clocks

- Digital output block
  - Digital output PB

- Panel control block
  - Panel control block
  - Transfer between panel and system control
  - Panel control reset

- Analog block
  - Input amplifier
  - Output amplifier
  - Muting circuit
  - A/D converter
  - D/A converter

REPLACEMENT PARTS LIST

Notes: *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC9	M5F78M12L	REGULATOR	⚠
IC10	M5F79M12L	REGULATOR	⚠
IC11	AN7812F	REGULATOR	⚠
IC12	AN7805F	REGULATOR	⚠
IC13	AN79M20F	REGULATOR	⚠
IC14	AN79L20	REGULATOR	
IC101	AN7030SE2	RF AMP	
IC102	AN7035SCE2	PLAYBACK PLL	
IC201	MN6742SDR	SERVO PROCESSOR	
IC202	MN53020SDQ	ATF	
IC203	AN8320NFA	LINEAR SERVO	
IC204, 205	AN3841SR	MOTOR DRIVE	
IC206	M5228FPE2	ANALOG SWITCH	
IC207	UPD74HC04GE2	INVERTER	
IC208	MN4066BS-T2	ANALOG SWITCH	
IC209	AN78L05ME2	REGULATOR	⚠
IC271	MN17541SDN2	MECHANISM CONTROL	
IC272	AN6607NSE2	MOTOR DRIVE	
IC273	AN1339SE2	VOLTAGE CONTROL	
IC274	TA7291S	TRAY MOTOR CONTROL	
IC275	TC4S81FTX	AND GATE	
IC301	MN18P8321SDP	SYSTEM CONTORL	
IC302	MN6624	DIGITAL SIGNAL PROCESSOR	
IC303	MN53040VPS	MEMORY CONTROL	
IC304	MN56100SDS	CLOCK GENERATOR	
IC305	L7A0541	GATE ARRAY	
IC306	MN1281R-TA	RESET GENERATOR	
IC307	SRM2A256LM10	S RAM	
IC308, 309	MC74HC273AF	D-FFS	
IC310	S22S12IF10	NON-VOLATILE RAM	
IC311, 312	UPD74HC74GE2	D-FF	
IC313, 314	MC74HC273AF	D-FF	
IC315	TC74HC541AF	3-STATE BUFFER	
IC316	MC74HC164F	8-BIT SHIFT REGISTER	
IC317	TC74HC166AF	8-BIT SHIFT REGISTER	
IC318, 319	UPD424260-80	4M DRAM	
IC320, 321	TC74HC166AF	8-BIT SHIFT REGISTER	
IC322, 323	MC74HC595AF	8-BIT SHIFT REGISTER	
IC324	M5M34050P	AES/EBU SELECT	
IC325	TORX178A	DIGITAL IN	
IC326	TOTX178	DIGITAL OUT	
IC331	MC74HC125AF	3-STATE BUS BUFFER	
IC332	UPD74HC04GE2	INVERTER	
IC333, 334	UPD74HC00G	NAND GATE	
IC335, 336	MC74HC02AF	NOR GATE	
IC337	UPD74HC00G	NAND GATE	
IC338, 339	MC74HC125AF	3-STATE BUS BUFFER	
IC340	T74HCU04AFTP	INVERTER	
IC341	UPD74HC00G	NAND GATE	
IC342	T74HCU04AFTP	INVERTER	
IC401-404	NJM4580EDTE1	INPUT AMP/FILTER AMP	
IC405	CS5339-KP	A/D CONVERTER	
IC406	SM5843AP	DIGITAL FILTER	
IC407, 408	PCM1702P	D/A CONVERTER	
IC409, 410	M5238FPE1	C-V AMP	
IC501, 502	NJM4580EDTE1	BUFFER AMP	
IC503, 504	NJM5532DD	BUFFER AMP	
IC551, 552	M5218L	CLASS AA AMP	
IC601	M50754-165FP	PANEL CONTROL	
IC602	AN6873S	INVERTER	
IC603	UPD74HC04G	INVERTER	
IC801	M5219FPE1	INPUT AMP(V SYNC)	
IC802	AN6914S	INPUT AMP(V SYNC)	
IC803, 804	M5238FPE1	PLL(D IN/V SYNC)	
		TRANSISTOR(S)	
Q102-105	UN5216-Q	TRANSISTOR	
Q106, 107	2SC3937TW	TRANSISTOR	
Q109	UN5216-Q	TRANSISTOR	
Q201	2SB956R	TRANSISTOR	
Q271	2SD1280STW	TRANSISTOR	
Q272	DTA123JKTW	TRANSISTOR	
Q274	2SB709RTW	TRANSISTOR	
Q275	DTC124EKTW	TRANSISTOR	
Q276	DTB113ZKTW	TRANSISTOR	
Q277	DTA114EKTW	TRANSISTOR	
Q301, 302	XN1112TW	TRANSISTOR	
Q303	XN1212TW	TRANSISTOR	
Q401	XN1212TW	TRANSISTOR	
Q471	2SD2037DEFTA	TRANSISTOR	⚠
Q472	2SB1357DEFTA	TRANSISTOR	⚠
Q501, 502	2SC3931CTX	TRANSISTOR	
Q503	XN1212TW	TRANSISTOR	
Q551-554	2SD1450RTA	TRANSISTOR	
Q571	2SC3311A-Q	TRANSISTOR	
Q572	2SA1309A-R	TRANSISTOR	
Q601-605	UN4111	TRANSISTOR	
Q801-804	2SD1819ASTX	TRANSISTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
Q805	XN1212TW	TRANSISTOR	
Q806	2SB1218ASTX	TRANSISTOR	
Q807	2SC3931CTX	TRANSISTOR	
Q808	2SD1819ASTX	TRANSISTOR	
Q809	2SB1218ASTX	TRANSISTOR	
Q810	XN1112TW	TRANSISTOR	
Q811-814	2SC3931CTX	TRANSISTOR	
Q816	2SC3931CTX	TRANSISTOR	
Q817	XN1112TW	TRANSISTOR	
Q818	2SD1819ASTX	TRANSISTOR	
Q880	2SA1309A-R	TRANSISTOR	⚠
Q881	2SC3311A-Q	TRANSISTOR	⚠
Q882	2SA1309A-R	TRANSISTOR	⚠
		DIODE(S)	
D11-15	1SR35200TB	DIODE	⚠
D17	1SR35200TB	DIODE	⚠
D19-22	1SR35200TB	DIODE	⚠
D201	MA701TX	DIODE	
D203	1N4606TR	DIODE	
D204	MA151ATW	DIODE	
D271	1S2473TR	DIODE	
D301-312	MA165	DIODE	
D313	MA719TA	DIODE	
D316, 317	LN28RCPP-JF	L. E. D.	
D318-327	MA165	DIODE	
D328, 329	MA4056MTA	DIODE	
D403-407	MA165	DIODE	
D471-474	MA719TA	DIODE	
D475, 476	MA4056MTA	DIODE	⚠
D501-504	MA165	DIODE	
D511, 512	MA719TA	DIODE	
D601-603	LN28RCPP-JF	L. E. D.	
D605	LN31GPH-JF2	L. E. D.	
D607	LN49YPH-JF1	L. E. D.	
D608	LN29RPH-JF1	L. E. D.	
D611-628	MA165	DIODE	
D630-643	MA165	DIODE	
D801-805	MA165	DIODE	
D806	RVDSVC321	DIODE	
D807-812	MA165	DIODE	
D813-815	RVDSVC321	DIODE	
D880-882	MA4056MTA	DIODE	⚠
D2001, 2002	MA165	DIODE	
		VARIABLE RESISTOR(S)	
VR104, 105	EVNDXAA00B53	RF REC LEVEL ADJ.	
VR106	EVNDXAA00B14	RF REC LEVEL ADJ.	
VR107, 108	EVNDXAA00B13	ATF GAIN/PLL FREE RUN ADJ.	
VR201	EVNDXAA00B54	PG PHASE ADJ.	

Ref. No.	Part No.	Part Name & Description	Remarks
VR271	EVNDCAA03B54	TAPE BEGIN/END DET. ADJ.	
VR401, 402	EVJC20F03A24	REC BALANCE/LEVEL CONTROL	
VR551	EVU57A022A14	HEADPHONES LEVEL CONTROL	
VR601	EVQWVS00004E	SHUTTLE SEARCH DIAL	
		COIL(S) AND COMBINATION(S)	
L1, 2	SLQX400-D	COIL	⚠
L101	ELJFA470KF	COIL	
L104	ELJFA180KF	COIL	
L106	ELJFA101KF	COIL	
L108	RLQZB471KT-D	COIL	
L109, 110	ELJFA180KF	COIL	
L120	RLQZB101KT-D	COIL	
L202	RLM9R001-Z	COIL	
L203	RLQZB101KT-D	COIL	
L301	EXCELDR35V	COMPONENT COMBINATION	
L303	RLQZB470KT-D	COIL	
L305	RLQZB2R2KT-D	COIL	
L310-317	EXCELDR35V	COMPONENT COMBINATION	
L320-322	EXCELDR35V	COMPONENT COMBINATION	
L401-404	EXCELDR35V	COMPONENT COMBINATION	
L501-504	EXCELDR35V	COMPONENT COMBINATION	
L550-552	EXCELDR35V	COMPONENT COMBINATION	
L801-803	RL03B002-M	COIL	
		TRANSFORMER(S)	
T1	SLT5M523	POWER TRANSFORMER	⚠
T301	RLZ0006-0	TRANSFORMER	⚠
		COMPONENT COMBINATION(S)	
Z301, 302	EXCEMT471BT	COMPONENT COMBINATION	
		REMOTE SENSOR(S)	
RM601	RCDHC-212	REMOTE SENSOR	
		OSCILLATOR(S)	
X201	RSXC8M00J01T	OSCILLATOR	
X202	RSXY8M00M01T	OSCILLATOR	
X301	RSXY8M00M01T	OSCILLATOR	
X302	RSXC28M2S01T	OSCILLATOR	
X601	RSXY6M00M01T	OSCILLATOR	
X801	RSXB8M82H01	OSCILLATOR	
X802	RSXB9M60H01	OSCILLATOR	
		DISPLAY TUBE	
FL601	RSL0062-F	DISPLAY TUBE	

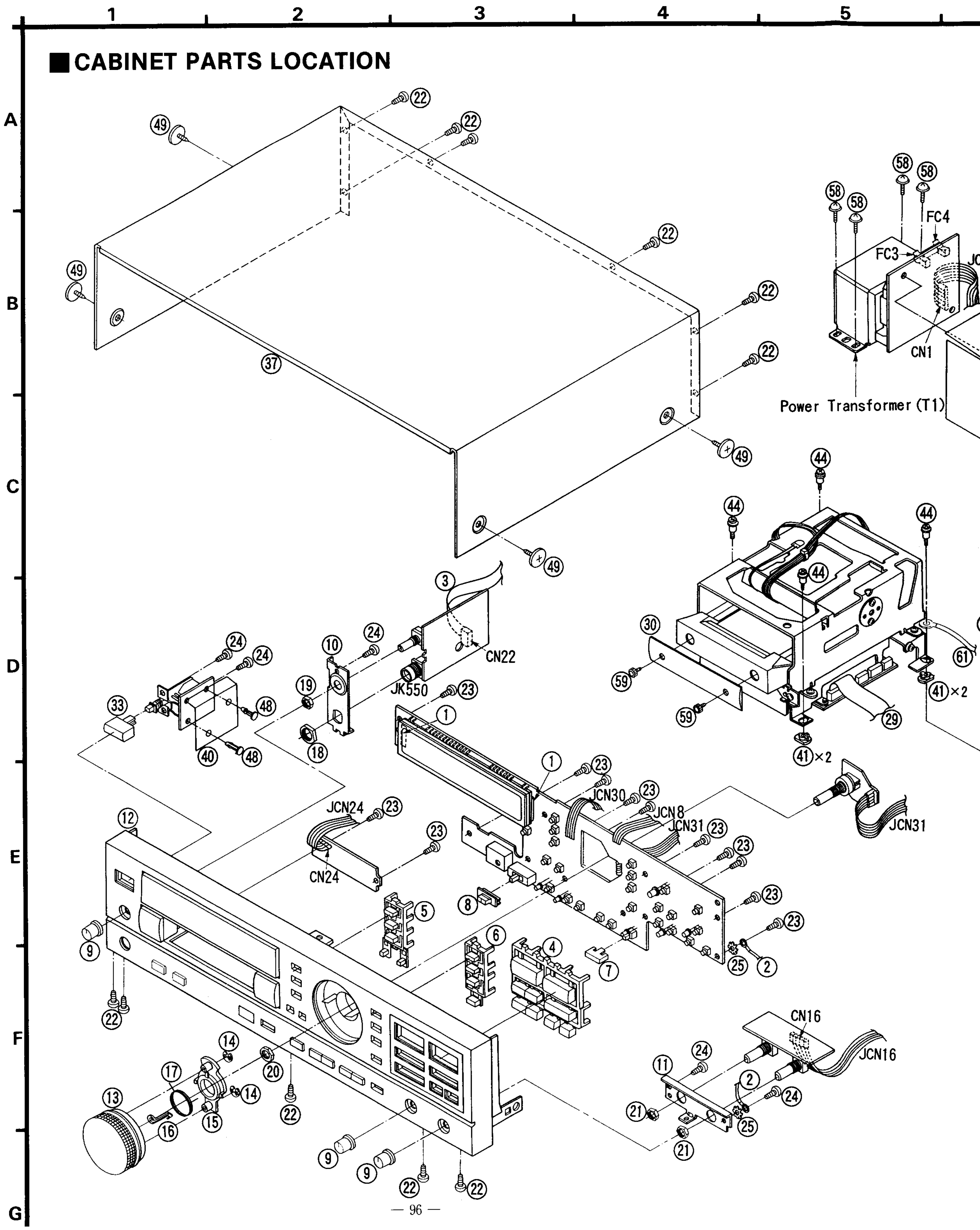
Ref. No.	Part No.	Part Name & Description	Remarks
		FUSE (S)	
F2	XBA2C02TB0S	FUSE 250V 200mA	⚠
		SWITCH(ES)	
S1	ESB8249V	POWER	⚠
S301	EVQQTG05R	TIME	
S302	EVQQTG05R	EXIT SYNC	
S501	ESD1521201	OUTPUT LEVEL	
S601	ESD1511301	ANALOG/DIGITAL	
S602	ESB64807	QUICK START	
S611	EVQQTG05R	ERASE	
S612	EVQQTG05R	END SEARCH	
S613	EVQQTG05R	START ID	
S614	EVQQTG05R	SKIP ID	
S615	EVQQTG05R	END	
S616	EVQQTG05R	RESET	
S617	EVQQTG05R	RENUMBER	
S618	EVQQTG05R	REW	
S619	EVQQTG05R	FF	
S620	EVQQTG05R	FADE OUT	
S621	EVQQTG05R	FADE IN	
S622	EVQQTG05R	LOCATE LAST	
S623	EVQQTG05R	COUNTER MODE	
S624	EVQQTG05R	RVS SKIP	
S625	EVQQTG05R	FWD SKIP	
S626	EVQQTG05R	PAUSE	
S627	EVQQTG05R	REC	
S628	EVQQTG05R	AUTO REC MUTE	
S630	EVQQTG05R	WRITE	
S631	EVQQTG05R	PLAY	
S632	EVQQTG05R	STOP	
S633	EVQQTG05R	SKIP PLAY CANCEL	
S634	EVQQTG05R	MUSIC SCAN	
S635	EVQQTG05R	OPEN/CLOSE	
S751	SSPD18-1	OPEN DET.	
S752	SSPD18-1	CLOSE DET.	
		RELAY(S)	
RL401	AG80239	RELAY	
RL501, 502	AG80239	RELAY	
		CONNECTOR(S)	
CN1	RHR197ZA	CONNECTOR(10P)	
CN2	SJSD1005	CONNECTOR(10P)	
CN5	RHR193ZA	CONNECTOR(6P)	
CN6, 7	RJS6T4ZA	CONNECTOR(6P)	
CN9	REZ0121A	CONNECTOR(6P)	

Ref. No.	Part No.	Part Name & Description	Remarks
CN10	RJP6G27ZA	CONNECTOR(6P)	
CN15	RJS6T4ZA	CONNECTOR(6P)	
CN16	RHR193ZA	CONNECTOR(6P)	
CN21, 22	RJS6Q8ZA	CONNECTOR(6P)	
CN23	RJS6T4ZA	CONNECTOR(6P)	
CN24	RHR193ZA	CONNECTOR(6P)	
CN26	RJP8G27ZA	CONNECTOR(8P)	
CN29	RJS5T4ZA	CONNECTOR(5P)	
CN31	RHR192ZA	CONNECTOR(5P)	
CN32	RHR190ZA	CONNECTOR(3P)	
CN33	RJS3T4ZA	CONNECTOR(3P)	
CN35	RJS6T4ZA	CONNECTOR(6P)	
CN36	RHR193ZA	CONNECTOR(6P)	
CN41	RJP10G27ZA	CONNECTOR(10P)	
CN43, 44	SJSD1721	CONNECTOR(17P)	
CN45	RJP5G27ZA	CONNECTOR(5P)	
CN51	RJP3G27ZA	CONNECTOR(3P)	
CN52-54	RJS1A6315	CONNECTOR(15P)	
CN56	RJP4G28ZA	CONNECTOR(4P)	
CN57	RJP6G28ZA	CONNECTOR(6P)	
CN58	RJT036W002	CONNECTOR(2P)	
CN62	RJS7Q11ZA	CONNECTOR(7P)	
CN402	RJP6G27ZA	CONNECTOR(6P)	
CN501	RHR193ZA	CONNECTOR(6P)	
CN502	RJS6T4ZA	CONNECTOR(6P)	
		CONNECTOR ASS' Y	
J4	REZ0237A-1	CONNECTOR ASS' Y(1P)	
JCN1	RWJ4310110QQ	FLAT CABLE(10P)	
JCN5	REZ0692	CONNECTOR ASS' Y(6P)	
JCN8	RWJ6506400KQ	FLAT CABLE(6P)	
JCN16	REZ0689	CONNECTOR ASS' Y(6P)	
JCN24	REZ0690	CONNECTOR ASS' Y(6P)	
JCN30	RWJ6505230KQ	FLAT CABLE(5P)	
JCN31	RWJ6505070KQ	FLAT CABLE(5P)	
JCN32	REZ0688	CONNECTOR ASS' Y(3P)	
JCN36	REZ0691	CONNECTOR ASS' Y(6P)	
JCN42	REZ0125A	CONNECTOR ASS' Y(10P)	
JCN46	REZ0126A	CONNECTOR ASS' Y(5P)	
JCN56	REZ0127A	CONNECTOR ASS' Y(6P)	
JCN70	RWJ4302200KK	FLAT CABLE(2P)	
JCN401	REZ0687	CONNECTOR ASS' Y(6P)	
JCN501	REZ0693	CONNECTOR ASS' Y(6P)	
		JACK(S)	
JK1	SWCD470M1	AC INLET	⚠
JK301	RJS1A9703-R	DIGITAL AES/EBU REC IN	
JK302	RJS1A9803-R	DIGITAL AES/EBU PLAY OUT	
JK303	SJFD7-2	IEC COAXIAL REC IN	
JK304A	SJFD7-2	IEC COAXIAL PLAY OUT	

Ref. No.	Part No.	Part Name & Description	Remarks
JK304B	RJJ63TS01	GPI (PLAY/PAUSE)	
JK306	QJS1955H	REMOTE CONTROL (PARALLEL)	
JK401	RJS1A9703-R	ANALOG REC IN(R)	
JK402	RJS1A9703-R	ANALOG REC IN(L)	
JK501	RJS1A9803-R	ANALOG PLAY OUT(R)	
JK502	RJS1A9803-R	ANALOG PLAY OUT(L)	
JK550	SJJD19	HEADPHONES	
JK801	RJH9301	EXT SYNC IN/OUT	
		EARTH PLATE (S)	
E1	SNE1004-2	EARTH PLATE	
E11	SNE1004-2	EARTH PLATE	
		FUSE HOLDER (S)	
FC3, 4	EYF52BC	FUSE HOLDER	
		CABINET AND CHASSIS	
1	RMA0202	FL HOLDER	
2	REZ0135A	CONNECTOR ASS'Y (1P)	
3	REZ0136A	FFC (6P)	
4	RGU0235-H	OPERATION (A) BUTTON	
5	RGU0236-H	OPERATION (B) BUTTON	
6	RGU0237-H	OPERATION (C) BUTTON	
7	RGU0238	INPUT SELECTOR BUTTON	
8	RGV0033	TIMER SWITCH KNOB	
9	RGW0055	H. P. /BALANCE/REC LEVEL KNOB	
10	RMA0192	HEADPHONES HOLDER	
11	RMA0193	BALANCE/REC LEVEL HOLDER	
12	RFKGV4100P-H	FRONT PANEL ASS'Y	
13	RFKNV3700PH	SHUTTLE KNOB ASS'Y	
14	CSTW-2	RING	
15	SHRD202	RESIN PARTS	
16	SHR9451	NYLON STOPPER	
17	SUSD162-1	SPRING	
18	XNS12	NUT	
19	XNS7S	NUT	
20	XNS8S	NUT	
21	XNS9	NUT	
22	XTBS3+8JFZ1	SCREW	
23	XTB3+10GFR	SCREW	
24	XTB3+8GFR	SCREW	
25	XWC3B	WASHER	
26	RJS1E0164	IC SOCKET	
27	RMA0408	REMOTE CONTROL ANGLE	
28	XTB3+8J	SCREW	
29	REZ0137A	FFC (17P)	
30	RGK0165A-H	TRAY ORNAMENT	
31	RGQ0046	WIRE SADDLE	
32	RFKHV4100EBH	REAR PANEL ASS'Y	(EB)

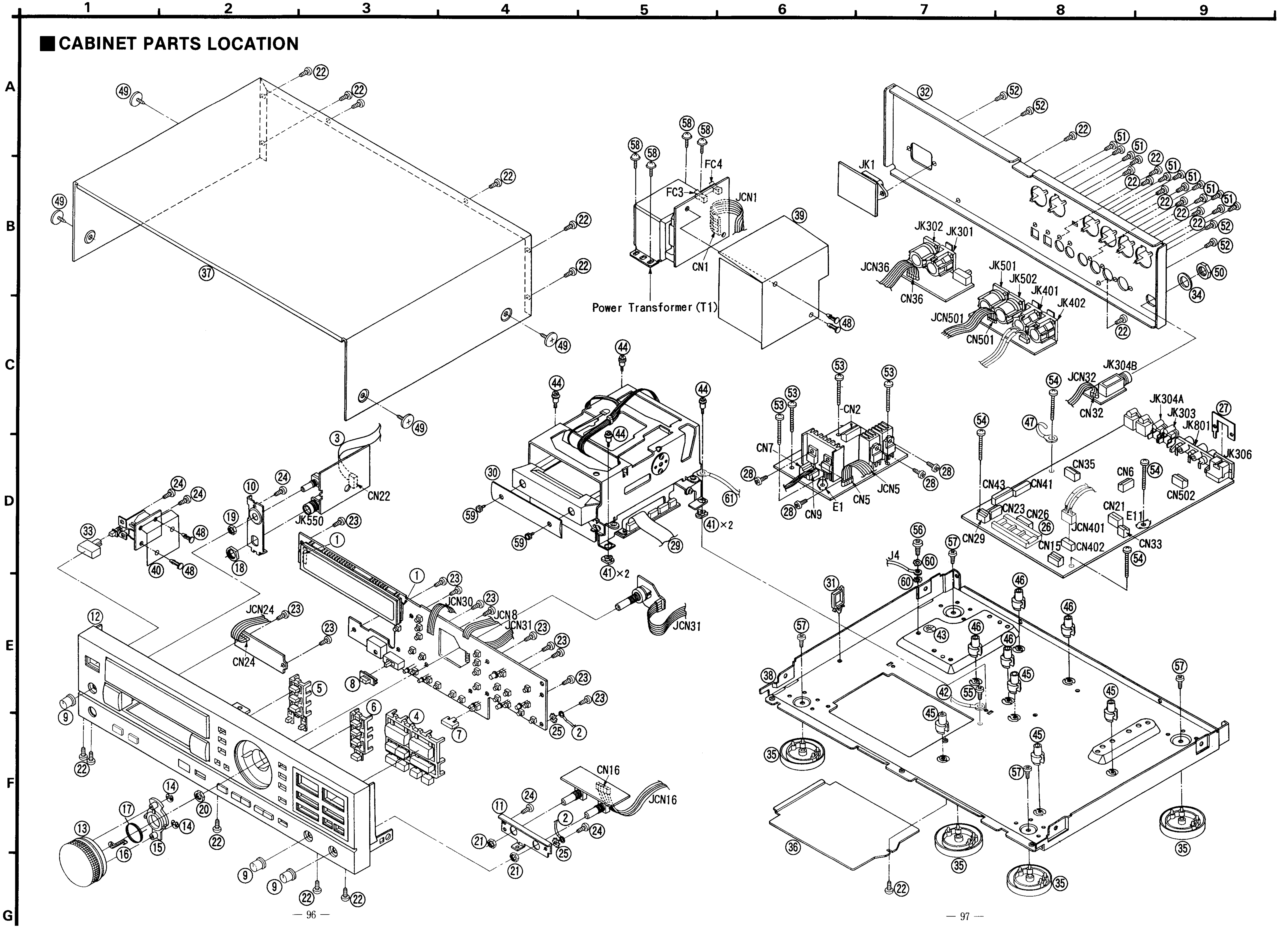
Ref. No.	Part No.	Part Name & Description	Remarks
32	RFKHV4100EGH	REAR PANEL ASS'Y	(EG)
33	RGU0030A	POWER BUTTON	
34	RHW1A001	WASHER	
35	RKA0009-K	FOOT	
36	RKF0089	HOLDER (SERVO P. C. B.)	
37	RKM0076-H1	CABINET	
38	RMK0068-2	CHASSIS	
39	RMZ0095-1	INSULATION SHEET (A)	
40	RMZ0096	INSULATION SHEET (B)	
41	RMG0134	MECHANISM SUPPORT	
42	YD20020417A	CONNECTOR ASS'Y (1P)	
43	SGK867	EARTH LABEL	
44	SHDD4-1	SCREW	
45	SHE181	P. C. B. SUPPORT (A)	
46	SHE185-2	P. C. B. SUPPORT (B)	
47	SHE36-3	BINDER	
48	SHR9815	RIVET	
49	SNE2095-5	SCREW	
50	XNS12FN	NUT	
51	XSN3+6FZ	SCREW	
52	XTBS3+8FFZ1	SCREW	
53	XTB3+16JFR	SCREW	
54	XTB3+20JFR	SCREW	
55	XTB3+6F	SCREW	
56	XTB4+8F	SCREW	
57	XTV3+6G	SCREW	
58	XTW3+6T	SCREW	
59	XVE3A4FP	SCREW	
60	XWC4B	WASHER	

■CABINET PARTS LOCATION



tion	Remarks
	(EG)

■CABINET PARTS LOCATION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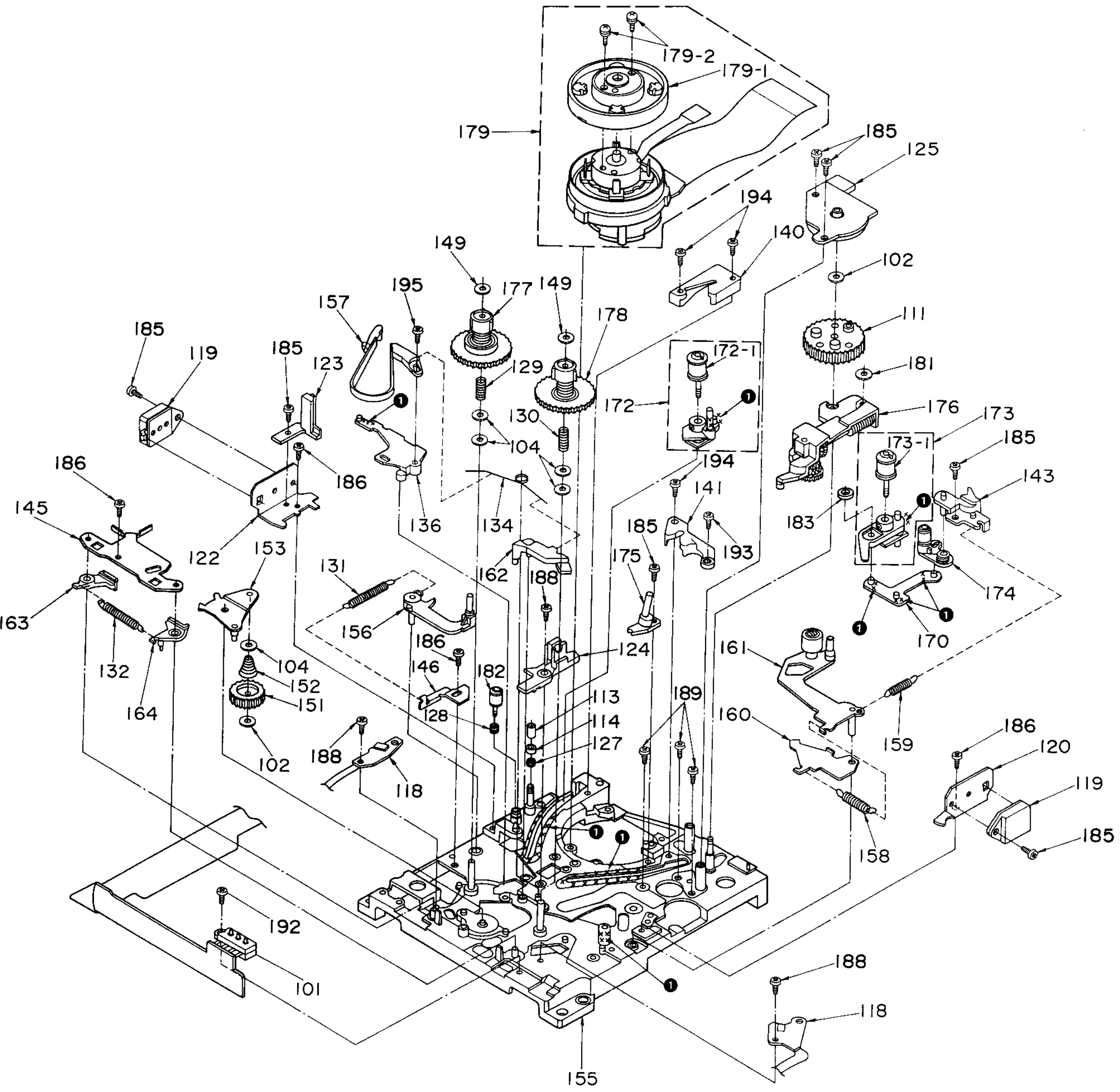
MECHANISM PARTS LOCATION

(Top view)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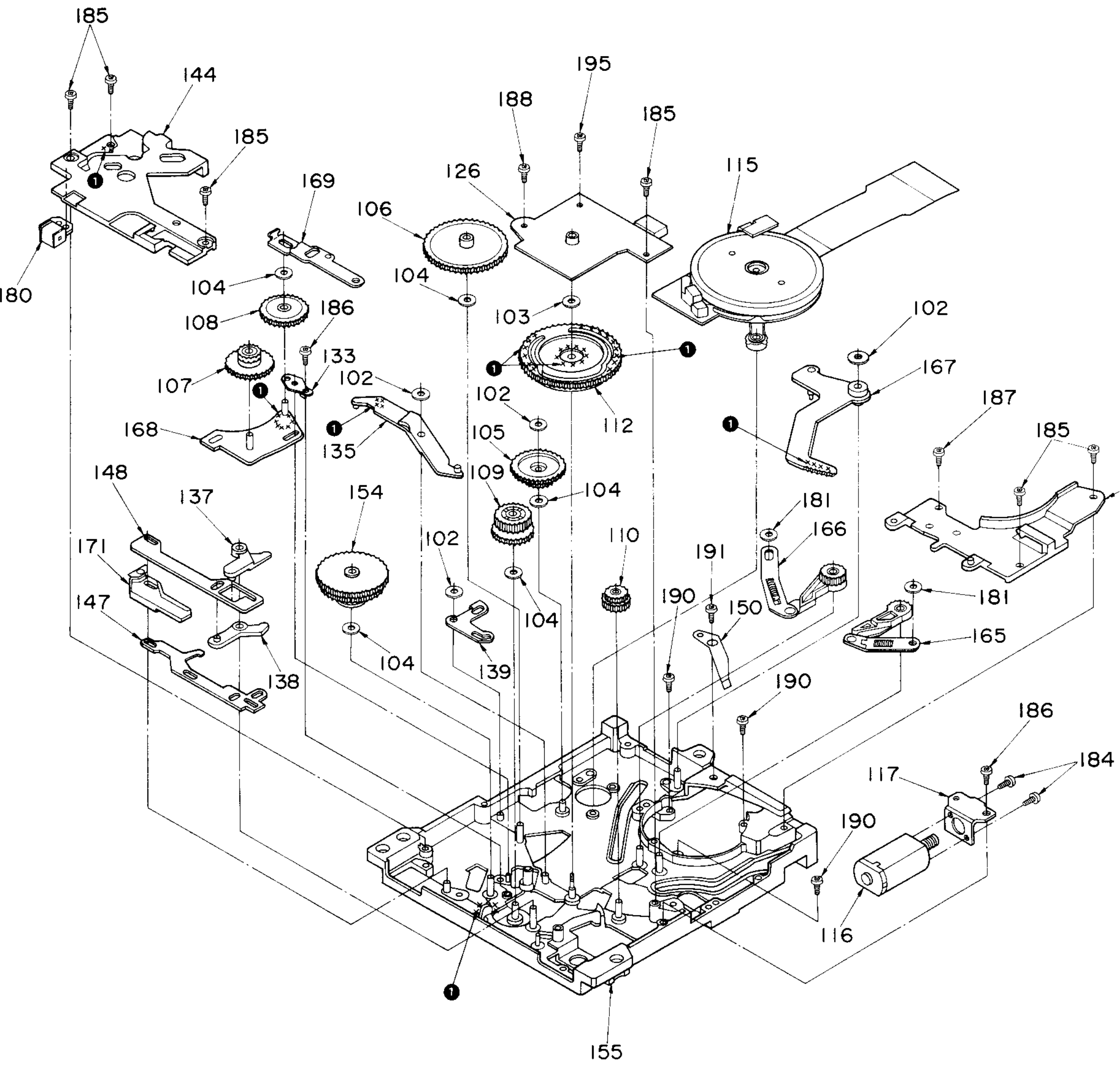
(Bottom view)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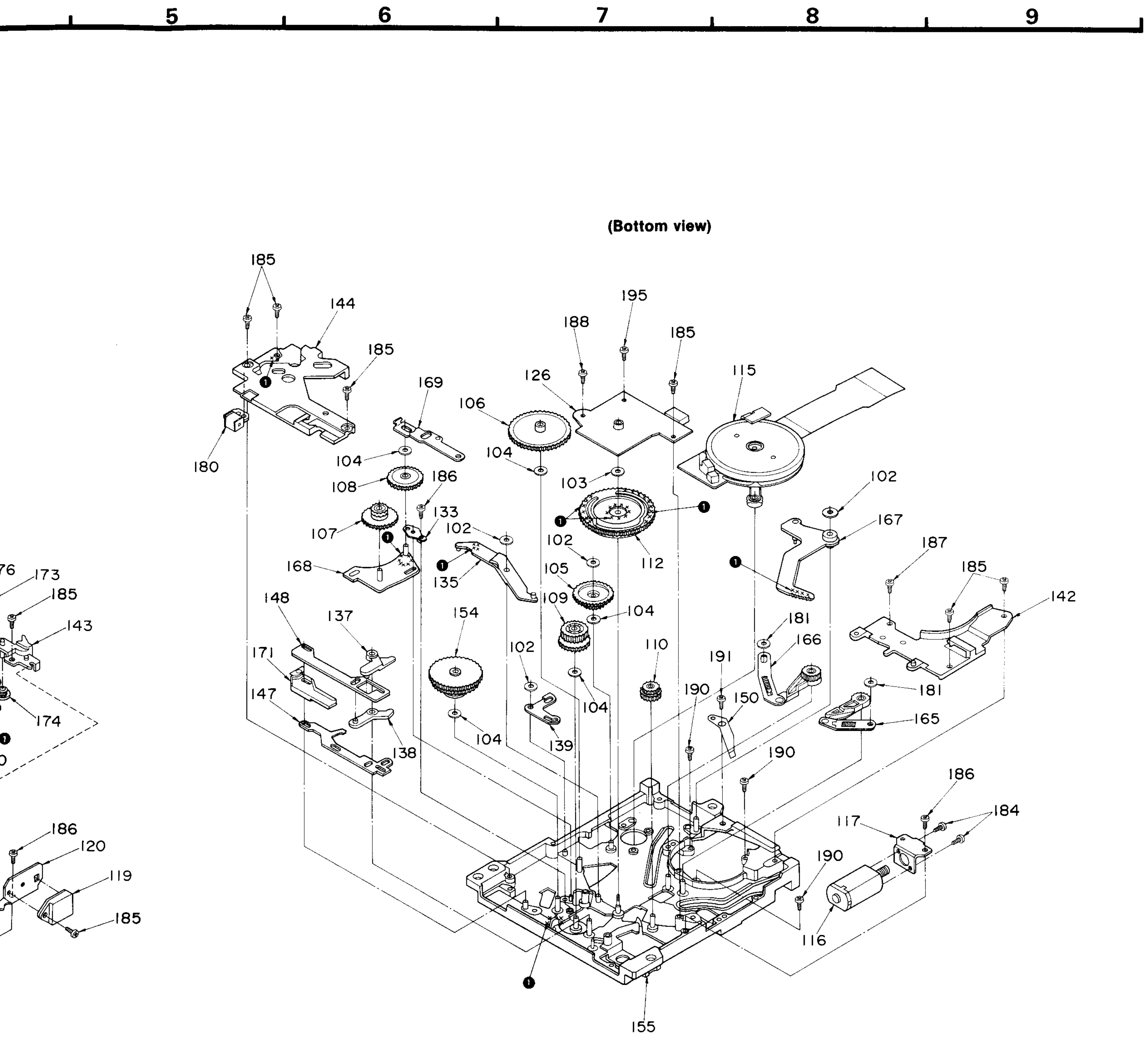
Note: When changing mechanism parts, apply the specified grease to the areas marked "× ×" as shown in the drawing.

Ref. No.	Part No.
●	RZZ0L05

REPLACE

Ref. No.	Part No.
101	EVQWR4002
102	QBW2008
103	QBW2030
104	QBW2059
105	RDG0066-1
106	RDG0067
107	RDG0068
108	RDG0069
109	RDG0070
110	RDG0073-1
111	RDK0006-1
112	RDK0007-1
113	RDP0020
114	RDP0021
115	REM0001-1
116	REM0009
117	RMN0028
118	REQ0012
119	REQ0014
120	RMN0030
122	RMN0029
123	RMQ0059
124	REQ0018
125	EVQWXN001
126	EVQWXM001
127	RMB0061
128	RMB0063
129	RMB0071
130	RMB0073-1
131	RMB0074
132	RMB0075
133	RMC0034
134	RME0037-1
135	RML0088
136	RML0090-1
137	RML0094
138	RML0095
139	RML0103
140	RMQ0052
141	RMQ0053
142	RMQ0055
143	RMQ0056-1
144	RMQ0058-1
145	RMQ0062
146	RMQ0063
147	RMQ0064-1
148	RMQ0065-1
149	RNW172ZA
150	RUS740ZA



Note: When changing mechanism parts, apply the specified grease to the areas marked "× ×" as shown in the drawing.

Ref. No.	Part No.
●	RZZ0L05

■ REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description	Remarks
		MECHANISM PARTS	
101	EVQWR4002	CASSETTE SW.	
102	QBW2008	WASHER	
103	QBW2030	WASHER	
104	QBW2059	WASHER	
105	RDG0066-1	MAIN GEAR A	
106	RDG0067	MAIN GEAR B	
107	RDG0068	IDLER GEAR(P)	
108	RDG0069	IDLER GEAR(F)	
109	RDG0070	COUNTER GEAR	
110	RDG0073-1	MODE REPEATING GEAR	
111	RDK0006-1	LOAD CAM	
112	RDK0007-1	MODE CAM	
113	RDP0020	FIXED POST	
114	RDP0021	FIXED POST PLATE	
115	REM0001-1	CAPSTAN UNIT	
116	REM0009	MODE MOTOR ASS'Y	
117	RMN0028	HOLDER, MODE MOTOR	
118	REQ0012	INTERFACE P. C. B.	
119	REQ0014	BEGIN/END DET. SENSER ASS'Y	
120	RMN0030	BEGIN DET. ANGLE	
122	RMN0029	END DET. ANGLE	
123	RMQ0059	LEAD OPENER	
124	REQ0018	BEGIN/END DET. LED ASS'Y	
125	EVQWXN001	LOAD SW ASS'Y	
126	EVQWXM001	MODE SW ASS'Y	
127	RMB0061	SPRING, FIXED POST	
128	RMB0063	SPRING, GUIDE ROLLER	
129	RMB0071	SPRING, S. REEL	
130	RMB0073-1	SPRING, T. REEL	
131	RMB0074	SPRING, TENSION	
132	RMB0075	SPRING, BRAKE	
133	RMC0034	ANGLE	
134	RME0037-1	SPRING, BT	
135	RML0088	LEVER, PINCH	
136	RML0090-1	LEVER, TENSION	
137	RML0094	LEVER, S. BRAKE	
138	RML0095	LEVER, T. BRAKE	
139	RML0103	LEVER, LOARD SELECT	
140	RMQ0052	S. STOPPER	
141	RMQ0053	T. STOPPER	
142	RMQ0055	LOAD GUIDE HOLDER	
143	RMQ0056-1	GUIDE ARM STOPPER	
144	RMQ0058-1	MODE GUIDE PLATE	
145	RMQ0062	IDLER GUIDE	
146	RMQ0063	TENSION SPRING HOOK	
147	RMQ0064-1	S. BRAKE DRIVE PLATE	
148	RMQ0065-1	T. BRAKE DRIVE PLATE	
149	RNW172ZA	WASHER	
150	RUS740ZA	EARTH ANGLE	
151	RDG0071	IDLER GEAR	
152	RMB0069	IDLER SPRING	
153	RXL0051	IDLER ARM ASS'Y	
154	RXG0011-2	DRIVE GEAR	
155	RXK0019	CHASSIS UNIT	
156	RXL0035-6	TENSION ARM ASS'Y	
157	RXL0036	TENSION BAND ASS'Y	
158	RMB0066	PIN-PRESSURE SPRING	
159	RMB0067	PINCH ROLLER SPRING	
160	RMM0036	PIN-PRESSURE LINK	
161	RXL0046	PINCH ARM ASS'Y	
162	RXL0048	BT LEVER ASS'Y	
163	RXL0049	S. BRAKE ASS'Y	
164	RXL0050	T. BRAKE ASS'Y	
165	RXL0052-1	S. LOAD ARM	
166	RXL0054-1	T. LOAD ARM	
167	RXL0056-2	LOAD LEVER	
168	RXL0057	P. F. IDLER ASS'Y	
169	RXL0058	LEVER, P. F. SELECTION	
170	RXM0018	GUIDE LINK ASS'Y	
171	RXM0019-1	PLUNGER LINK ASS'Y	
172	RXP0016-4	S. POST ROLLER ASS'Y	
172-1	RXP0008	POST ROLLER	
173	RXP0017-3	T. POST ROLLER ASS'Y	
173-1	RXP0008	POST ROLLER	
174	RXP0020-1	T. GUIDE ROLLER	
175	RXQ0057	T. INCLINED BASE ASS'Y	
176	RXQ0079-1	LOAD HOLDER ASS'Y	
177	RXR0006-1	S. REEL ASS'Y	
178	RXR0007-1	T. REEL ASS'Y	
179	VEG0752-1	CYLINDER UNIT	
179-1	VEH0460	UPPER CYLINDER	
179-2	VHD0593	SCREW	
180	RSJ0006	PLUNGER	
181	QBW2081A	WASHER	
182	RXP0031	GUIDE ROLLER	
183	RHW12009	GUIDE WASHER	
184	XQN14+C16	SCREW	
185	RHQ0014	SCREW	
186	RHQ0007	SCREW	
187	RHQ0015	SCREW	
188	RHQ0016	SCREW	
189	RHQ0017	SCREW	
190	XQN16+A45T	SCREW	
191	XQN2+A2	SCREW	
192	RHQ0018	SCREW	
193	RHQ0019	SCREW	
194	RHQ0020	SCREW	
195	QHQ1371	SCREW	

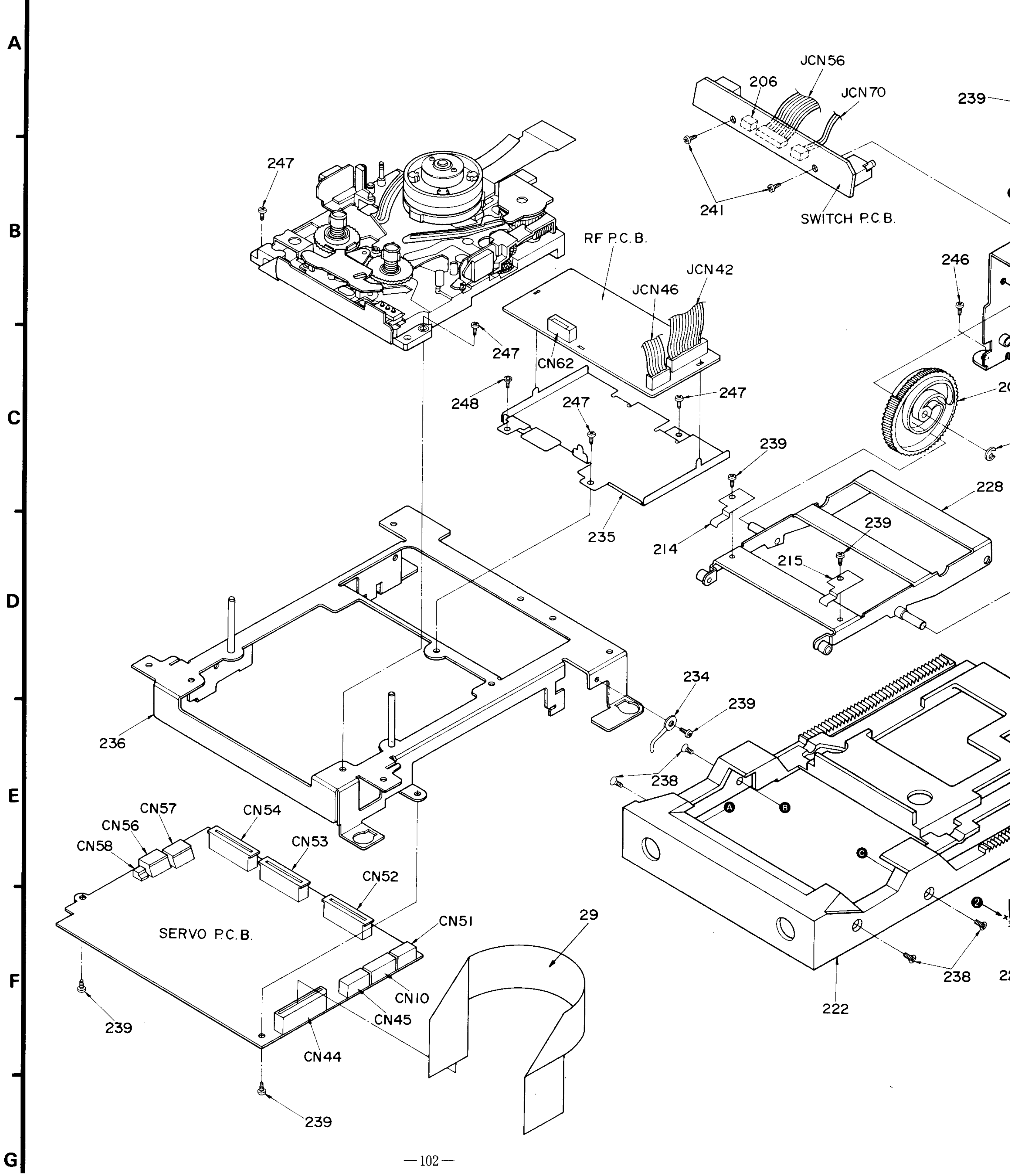
Ref. No.	Part No.	Part Name & Description	Remarks
		LOADING PARTS	
201	RFKPVDA10-K	MOTOR ASS'Y(M751)	
202	RDB0032	GEAR SHAFT HOLDER	
203	RDG0120-2	MAIN GEAR(R)	
204	RDG0122-1	MAIN GEAR(L)	
205	RFKNVDA10BK	GEAR SHAFT ASS'Y	
206	RJP2G27ZA	CONNECTOR(CN72)(2P)	
207	RMA0194	SHAFT FRAME	
208	RMA0486	CASSETTE HOLDER ANGLE	
209	RMA0200	HOLDER ARM	
210	RMB0110	SPRING	
211	RMB0111	SPRING	
212	RMB0131	SPRING	
213	RMB0144	SPRING	
214	RMC0050-1	ANGLE(L)	
215	RMC0051-1	ANGLE(R)	
216	RMG0090	RUBBER	
217	RML0139-1	SHAFT HOLDER(R)	
218	RML0140-1	HOLDER(R)	
219	RML0141-1	SHAFT HOLDER(L)	
220	RML0142-1	HOLDER(L)	
221	RML0150-1	MAIN GEAR HOLDER	
222	RMR0206-H	TRAY	
223	RMR0207-H	CASSETTE HOLDER	
224	RMR0209-1	SHAFT ANGLE	
225	RMS0158-1	SHAFT	
226	RMS0160	SHAFT	
227	RMS0165	SHAFT	
228	RXA0046	SUB FRAME	
229	RXA0047	CASSETTE HOLDER	
230	RXK0059	FRAME	
231	SMQ20025	BELT	
232	SMQ40032	PULLEY GEAR	
233	EYHS78R	DEW SENSOR	
234	SHE36-3	EARTH TERMINAL	
235	RSC0066	SHIELD PLATE	
236	RXA0060	MECHANISM FRAME	
237	RMX0044	WASHER	
238	XSS26+4FZ	SCREW	
239	XTB3+6J	SCREW	
240	XTN3+10G	SCREW	
241	XTN3+6B	SCREW	
242	XUC15FT	WASHER	
243	XUC2FT	WASHER	
244	XUC3FT	WASHER	
245	XYN26+C33	SCREW	
246	XTB3+6F	SCREW	
247	XTN3+8F	SCREW	
248	XSN2+3	SCREW	

Ref. No.	Part No.	Part Name & Description	Remarks
		<MECHANISM ASS'Y>	
MECH1	RAA1001	MECHANISM UNIT	(RTL)
		<PRINTED CIRCUIT BOARDS	
		ASS'Y>	
PCB1	REP1952A	OPERATION P. C. B.	(RTL)
PCB2	REP1950A	MAIN P. C. B.	(RTL)
PCB3	REP1951B	POWER SUPPLY P. C. B.	(RTL)
PCB4	REP0417A	RF/SERVO P. C. B.	(RTL)
PCB4-1	RFKBV3700-N	RF P. C. B.	(RTL)
PCB4-2	RFKBV3700-0	SERVO P. C. B.	(RTL)
PCB5	REP0421A	TRAY/SWITCH P. C. B.	(RTL)

Note:

The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

■LOADING PARTS LOCATION



Remarks
(RTL)
(RTL)
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(RTL)

tion Time is limited of this assembly in ailable for a specific of availability is in accordance with tion. After the end e available.

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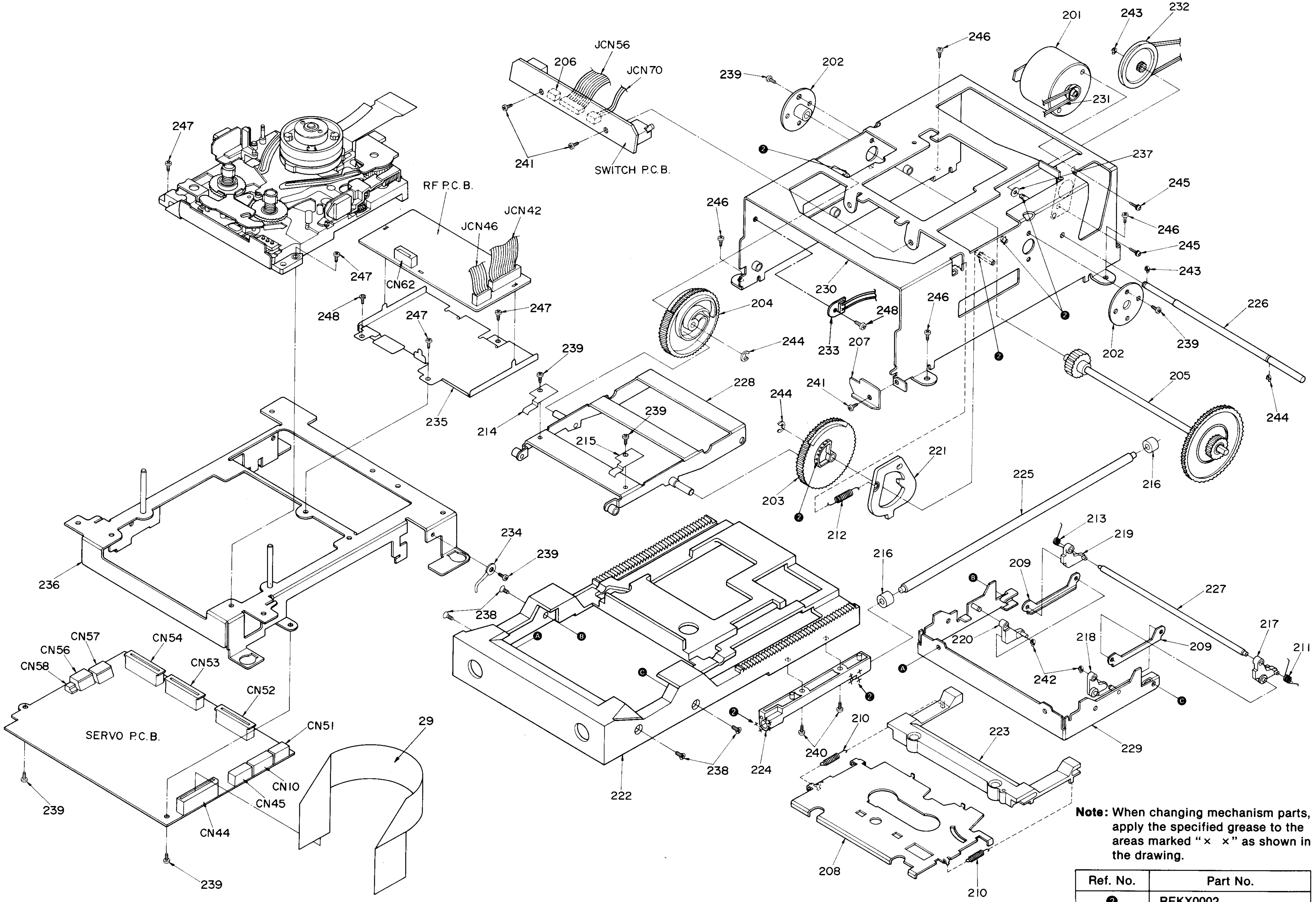
LOADING PARTS LOCATION


201
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232
246
202
239
JCN56
206
JCN70
231
237
245
246
245
243
226
241
SWITCH P.C.B.
247
RF P.C.B.
JCN42
JCN46
CN62
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CN57
CN54
CN56
CN58
CN53
CN52
CN51
29
SERVO P.C.B.
CN10
CN45
CN44
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239
222
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240
223
229
208
210
❷
A
B
C

Note: When changing mechanism parts, apply the specified grease to the areas marked "× ×" as shown in the drawing.

Ref. No.	Part No.
❷	RFKX0002

RESISTORS AND CAPACITORS

Notes : * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM), 1M=1,000k (OHM)

Ref. No.	Part No.	Values & Remarks
		RESISTORS
R11	ERDS2TJ392T	1/4W 3.9K
R12	ERD25FJ102	1/4W 1K ⚠
R13, 14	ERG1ANJP560S	1W 56
R101, 102	ERJ6GEYJ221V	1/10W 220
R103, 104	ERJ6GEYJ681V	1/10W 680
R112, 113	ERJ6GEYJ332V	1/10W 3.3K
R115	ERJ6GEYJ332V	1/10W 3.3K
R117	ERJ6GEYJ102V	1/10W 1K
R118	ERJ6GEYJ471V	1/10W 470
R123	ERJ6GEYJ822V	1/10W 8.2K
R124	ERJ6GEYJ152V	1/10W 1.5K
R126	ERJ6GEYJ152V	1/10W 1.5K
R128	ERJ6GEYJ822V	1/10W 8.2K
R131	ERJ6GEYJ331V	1/10W 330
R132, 133	ERJ6GEYJ221V	1/10W 220
R134	ERJ6GEYJ102V	1/10W 1K
R135, 136	ERJ6GEYJ471V	1/10W 470
R150	ERJ6GEYJ102V	1/10W 1K
R151, 152	ERJ6GEYJ471V	1/10W 470
R153	ERJ6GEYJ223V	1/10W 22K
R154, 155	ERJ6GEYJ471V	1/10W 470
R156, 157	ERJ6GEYJ222V	1/10W 2.2K
R158	ERJ6GEYJ102V	1/10W 1K
R159	ERJ6GEYJ223V	1/10W 22K
R160	ERJ6GEYJ221V	1/10W 220
R162	ERJ6GEYJ472V	1/10W 4.7K
R164, 165	ERJ6GEYJ472V	1/10W 4.7K
R167	ERJ6GEYJ332V	1/10W 3.3K
R168	ERJ6GEYJ102V	1/10W 1K
R169	ERJ6GEYJ471V	1/10W 470
R172	ERJ6GEYJ102V	1/10W 1K
R173, 174	ERJ6GEYJ222V	1/10W 2.2K
R175	ERJ6GEYJ151V	1/10W 150
R176	ERJ6GEYJ104V	1/10W 100K
R178	ERJ6GEYJ820V	1/10W 82
R181	ERJ6GEYJ331V	1/10W 330
R193-195	ERJ6GEYJ102V	1/10W 1K
R196	ERJ6GEYJ103V	1/10W 10K
R197	ERJ6GEYJ102V	1/10W 1K
R201	ERJ6GEYJ102V	1/10W 1K
R202, 203	ERJ6GEYJ223V	1/10W 22K
R204	ERJ6GEYJ103V	1/10W 10K
R205	ERJ6GEYJ683V	1/10W 68K
R206	ERJ6GEYJ684V	1/10W 680K
R207	ERJ6GEYJ472V	1/10W 4.7K
R208	ERJ6GEYJ683V	1/10W 68K

Ref. No.	Part No.	Values & Remarks
R209	ERJ6GEYJ153V	1/10W 15K
R210	ERJ6GEYJ102V	1/10W 1K
R212	ERJ6GEYJ105	1/10W 1M
R213	ERJ6GEYJ274V	1/10W 270K
R214	ERJ6GEYJ682V	1/10W 6.8K
R215	ERJ6GEYJ184V	1/10W 180K
R216	ERJ6GEYJ101V	1/10W 100
R217, 218	ERJ6GEYJ472V	1/10W 4.7K
R219, 220	ERJ6GEYJ103V	1/10W 10K
R221, 222	ERJ6GEYJ474V	1/10W 470K
R223, 224	ERJ6GEYJ222V	1/10W 2.2K
R225, 226	ERJ6GEYJ184V	1/10W 180K
R227	ERJ6GEYJ102V	1/10W 1K
R228	ERJ6GEYJ222V	1/10W 2.2K
R229	ERJ6GEYJ103V	1/10W 10K
R230	ERJ6GEYJ681V	1/10W 680
R231	ERJ6GEYJ821V	1/10W 820
R232	ERJ6GEYJ333V	1/10W 33K
R233	ERJ6GEYJ393V	1/10W 39K
R234	ERJ6GEYJ333V	1/10W 33K
R235	ERJ6GEYJ473V	1/10W 47K
R236	ERJ6GEYJ332V	1/10W 3.3K
R237	ERX12SJR33E	1/2W 0.33 ⚠
R240	ERJ6GEYJ151V	1/10W 150
R241	ERJ6GEYJ333V	1/10W 33K
R242	ERJ6GEYJ103V	1/10W 10K
R243	ERJ6GEYJ473V	1/10W 47K
R244	ERJ6GEYJ102V	1/10W 1K
R245	ERX12SJR33E	1/2W 0.33 ⚠
R247	ERJ6GEYJ331V	1/10W 330
R248	ERJ6GEYJ822V	1/10W 8.2K
R249	ERJ6GEYJ472V	1/10W 4.7K
R250	ERJ6GEYJ153V	1/10W 15K
R251	ERJ6GEYJ104V	1/10W 100K
R271, 272	ERJ6GEYJ103V	1/10W 10K
R273	ERJ6GEYJ681V	1/10W 680
R274	ERSB39JR82U	1/4W 0.82
R275	ERJ6GEYJ473V	1/10W 47K
R277, 278	ERJ6GEYJ333V	1/10W 33K
R279	ERJ6GEYJ683V	1/10W 68K
R280	ERJ6GEYJ333V	1/10W 33K
R281	ERJ6GEYJ332V	1/10W 3.3K
R282	ERJ6GEYJ682V	1/10W 6.8K
R284	ERJ6GEYJ103V	1/10W 10K
R285	ERJ6GEYJ104V	1/10W 100K
R286	ERJ6GEYJ103V	1/10W 10K
R287	ERJ6GEYJ684V	1/10W 680K
R289, 290	ERJ6GEYJ473V	1/10W 47K
R292, 293	ERJ6GEYJ563V	1/10W 56K

Ref. No.	Part No.	Values & Remarks
R294-296	ERJ6GEYJ473V	1/10W 47K
R297	ERJ6GEYJ220	1/10W 22
R298	ERJ6GEYJ473V	1/10W 47K
R301, 302	ERDS2TJ101	1/4W 100
R303, 304	ERDS2TJ153	1/4W 15K
R305	ERDS2TJ221	1/4W 220
R306	ERDS2TJ103	1/4W 10K
R307, 308	ERDS2TJ270T	1/4W 27
R309	RRJ6GCAD750T	1/10W 75
R310	ERJ6GEYJ473V	1/10W 47K
R311	ERJ6GEYJ334V	1/10W 330K
R312	RRJ6GCAD750T	1/10W 75
R313	ERJ6GEYJ100	1/10W 10
R314	ERJ6GEYJ223V	1/10W 22K
R315	ERDS2TJ221	1/4W 220
R316	ERJ6GEYJ473V	1/10W 47K
R317, 318	ERJ6GEYJ104V	1/10W 100K
R319	ERJ6GEYJ331V	1/10W 330
R320-329	ERJ6GEYJ104V	1/10W 100K
R330-337	ERJ6GEYJ101V	1/10W 100
R338-340	ERJ6GEYJ104V	1/10W 100K
R341, 342	ERDS2TJ331	1/4W 330
R343, 344	ERJ6GEYJ104V	1/10W 100K
R345-347	ERJ6GEYJ473V	1/10W 47K
R348-351	ERJ6GEYJ332V	1/10W 3.3K
R352, 353	ERJ6GEYJ104V	1/10W 100K
R354	ERJ6GEYJ332V	1/10W 3.3K
R356	ERJ6GEYJ331V	1/10W 330
R357, 358	ERJ6GEYJ561V	1/10W 560
R359	ERJ6GEYJ331V	1/10W 330
R360-366	ERJ6GEYJ561V	1/10W 560
R367	ERJ6GEYJ331V	1/10W 330
R368-371	ERJ6GEYJ561V	1/10W 560
R372, 373	ERJ6GEYJ102V	1/10W 1K
R374	ERJ6GEYJ221V	1/10W 220
R375	ERJ6GEYJ561V	1/10W 560
R376	RRJ6GCAD750T	1/10W 75
R377	ERJ6GEYJ470V	1/10W 47
R378-381	ERJ6GEYJ561V	1/10W 560
R382, 383	ERJ6GEYJ104V	1/10W 100K
R401, 402	ERDS2TJ183T	1/4W 18K
R403-406	RRJ6GCAD103T	1/10W 10K
R407-410	RRJ6GCAD332T	1/10W 3.3K
R411-416	RRJ6GCAD472T	1/10W 4.7K
R417-420	RRJ6GCAD103T	1/10W 10K
R421-424	RRJ6GCAD472T	1/10W 4.7K
R425, 426	ERJ6GEYJ101V	1/10W 100
R427, 428	RRJ6GCAD103T	1/10W 10K
R429, 430	RRJ6GCAD472T	1/10W 4.7K

Ref. No.	Part No.	Values & Remarks
R431, 432	RRJ6GCAD273T	1/10W 27K
R433, 434	ERJ6GEYJ225V	1/10W 2.2M
R435, 436	ERJ6GEYJ220	1/10W 22
R437, 438	ERJ6GEYJ331V	1/10W 330
R439, 440	ERJ6GEYJ220	1/10W 22
R441, 442	RRJ6GCAD222T	1/10W 2.2K
R443-446	RRJ6GCAD272T	1/10W 2.7K
R447, 448	RRJ6GCAD222T	1/10W 2.2K
R449, 450	RRJ6GCAD562T	1/10W 5.6K
R451	ERJ6GEYJ331V	1/10W 330
R452	ERJ6GEYJ561V	1/10W 560
R471, 472	ERJ6GEYJ471V	1/10W 470
R473-478	ERJ6GEYJ473V	1/10W 47K
R501, 502	ERJ6GEYJ102V	1/10W 1K
R503, 504	RRJ6GCAD472T	1/10W 4.7K
R505, 506	RRJ6GCAD122T	1/10W 1.2K
R507, 508	ERJ6GEYJ105	1/10W 1M
R509, 510	RRJ6GCAD332T	1/10W 3.3K
R511, 512	RRJ6GCAD562T	1/10W 5.6K
R513-520	RRJ6GCAD822T	1/10W 8.2K
R521, 522	RRJ6GCAD183T	1/10W 18K
R523, 524	ERJ6GEYJ124V	1/10W 120K
R525-528	RRJ6GCAD822T	1/10W 8.2K
R529, 530	RRJ6GCAD183T	1/10W 18K
R531, 532	ERJ6GEYJ394V	1/10W 390K
R533, 534	RRJ6GCAD183T	1/10W 18K
R535, 536	ERJ6GEYJ394V	1/10W 390K
R537-540	RRJ6GCAD750T	1/10W 75
R541-544	ERJ6GEYJ331V	1/10W 330
R545-548	ERJ6GEYJ103V	1/10W 10K
R549, 550	ERJ6GEYJ473V	1/10W 47K
R561-564	ERJ6GEYJ472V	1/10W 4.7K
R571, 572	ERJ6GEYJ102V	1/10W 1K
R575, 576	ERDS2TJ102	1/4W 1K
R577, 578	ERDS2TJ103	1/4W 10K
R579, 580	ERDS2TJ123	1/4W 12K
R581, 582	ERDS2TJ104	1/4W 100K
R583, 584	ERDAS3G100T	1/4W 10
R585, 586	ERDAS3G330T	1/4W 33
R587, 588	ERDAS3G332T	1/4W 3.3K
R589, 590	ERDAS3G102T	1/4W 1K
R591, 592	ERDS2EJ121	1/4W 120
R593-596	ERDS2TJ222	1/4W 2.2K
R601, 602	ERDS2TJ472	1/4W 4.7K
R603	ERDS2TJ473	1/4W 47K
R604	ERDS2TJ472	1/4W 4.7K
R605	ERDS2TJ100	1/4W 10
R606, 607	ERDS2TJ102	1/4W 1K
R610, 611	ERDS2TJ471	1/4W 470
R612	ERDS2TJ102	1/4W 1K
R613-619	ERDS2TJ103	1/4W 10K
R620	ERDS2TJ471	1/4W 470

Ref. No.	Part No.	Values & Remarks
R621	ERDS2TJ105T	1/4W 1M
R622	ERDS2TJ102	1/4W 1K
R801	RRJ6GCAD750T	1/10W 75
R802	ERJ6GEYJ101V	1/10W 100
R803	ERJ6GEYJ103V	1/10W 10K
R804	ERJ6GEYJ473V	1/10W 47K
R805	ERJ6GEYJ392V	1/10W 3.9K
R806	ERJ6GEYJ103V	1/10W 10K
R807	ERJ6GEYJ392V	1/10W 3.9K
R808	ERJ6GEYJ103V	1/10W 10K
R809	ERJ6GEYJ332V	1/10W 3.3K
R810, 811	ERJ6GEYJ103V	1/10W 10K
R812	ERJ6GEYJ223V	1/10W 22K
R813	ERJ6GEYJ103V	1/10W 10K
R814	ERJ6GEYJ223V	1/10W 22K
R815	ERJ6GEYJ103V	1/10W 10K
R816	ERJ6GEYJ471V	1/10W 470
R817	ERJ6GEYJ105	1/10W 1M
R818	ERJ6GEYJ472V	1/10W 4.7K
R819-821	ERJ6GEYJ103V	1/10W 10K
R822	RRJ6GCAD183T	1/10W 18K
R823	RRJ6GCAD683T	1/10W 68K
R824	ERJ6GEYJ103V	1/10W 10K
R825	RRJ6GCAD153T	1/10W 15K
R826	ERJ6GEYJ102V	1/10W 1K
R827	RRJ6GCAD822T	1/10W 8.2K
R828	ERJ6GEYJ332V	1/10W 3.3K
R829	RRJ6GCAD822T	1/10W 8.2K
R830	ERJ6GEYJ103V	1/10W 10K
R831	ERJ6GEYJ393V	1/10W 39K
R832	ERJ6GEYJ102V	1/10W 1K
R833	ERJ6GEYJ105	1/10W 1M
R834	RRJ6GCAD750T	1/10W 75
R835, 836	ERJ6GEYJ102V	1/10W 1K
R837	RRJ6GCAD750T	1/10W 75
R838, 839	ERJ6GEYJ1R0V	1/10W 1.0
R840, 841	ERJ6GEYJ102V	1/10W 1K
R842	ERJ6GEYJ472V	1/10W 4.7K
R843, 844	ERJ6GEYJ103V	1/10W 10K
R845	ERJ6GEYJ334V	1/10W 330K
R846, 847	ERJ6GEYJ473V	1/10W 47K
R848, 849	ERJ6GEYJ472V	1/10W 4.7K
R850	ERJ6GEYJ683V	1/10W 68K
R851	ERJ6GEYJ473V	1/10W 47K
R852, 853	ERJ6GEYJ152V	1/10W 1.5K
R854	ERJ6GEYJ105	1/10W 1M
R855	ERJ6GEYJ472V	1/10W 4.7K
R856, 857	ERJ6GEYJ103V	1/10W 10K
R859	ERJ6GEYJ102V	1/10W 1K
R860	ERJ6GEYJ393V	1/10W 39K
R861	ERJ6GEYJ102V	1/10W 1K
R862	ERJ6GEYJ105	1/10W 1M

Ref. No.	Part No.	Values & Remarks
R880-882	ERJ6GEYJ471V	1/10W 470
R890	ERJ6GEYJ682V	1/10W 6.8K
R891	ERJ6GEYJ392V	1/10W 3.9K
R892	ERJ6GEYJ682V	1/10W 6.8K
R893	ERJ6GEYJ332V	1/10W 3.3K
R894	ERJ6GEYJ103V	1/10W 10K
R895	ERJ6GEYJ105	1/10W 1M
		CAPACITORS
C1	ECKWNS102MBM	400V 1000P ⚠
C11-18	ECKR1H103ZF5	50V 0.01U
C20, 21	ECKR1H103ZF5	50V 0.01U
C22, 23	ECEA1EPZ332E	25V 3300U ⚠
C24	ECES1EU682G	25V 6800U ⚠
C25	ECEA1CU472E	16V 4700U ⚠
C26	ECEA1HU221B	50V 220U ⚠
C27-30	ECEA1CU100	16V 10U
C31	ECEA1VU330	35V 33U
C32	ECKR1H103ZF5	50V 0.01U
C33	ECEA1EU470	25V 47U
C34	ECKR1H103ZF5	50V 0.01U
C101, 102	ECUV1H222KBN	50V 2200P
C103, 104	ECUV1H471KCN	50V 470P
C105	ECUV1H470JCN	50V 47P
C107	ECUV1H222KBN	50V 2200P
C110	ECEA0JK221B	6.3V 220U
C123	ECUV1C105ZFM	16V 1U
C124, 125	ECUV1H472KBN	50V 4700P
C126, 127	ECUV1H470JCN	50V 47P
C129, 130	ECEA0JKS220B	6.3V 22U
C131	ECUV1H222KBN	50V 2200P
C150	ECUV1H471KCN	50V 470P
C151	ECUV1H222KBN	50V 2200P
C152	ECUV1H102KBN	50V 1000P
C154	ECUV1H220JCN	50V 22P
C155, 156	ECUV1H102KBN	50V 1000P
C157	ECUV1C105ZFM	16V 1U
C159	ECUV1H220JCN	50V 22P
C161	ECUV1H562KBN	50V 5600P
C163	ECUV1H562KBN	50V 5600P
C166	ECUV1E153MBN	25V 0.015U
C167	ECUV1H102KBN	50V 1000P
C168	ECUV1H270JCN	50V 27P
C169	ECUV1H100JCN	50V 10P
C171, 172	ECUV1H680JCN	50V 68P
C173	ECUV1H471KCN	50V 470P
C174	ECUV1E104MBN	25V 0.1U
C175	ECUV1H472KBN	50V 4700P
C176	ECUV1E333MDN	25V 0.033U
C177, 178	ECUV1H101KCN	50V 100P
C179	ECUV1E104MBN	25V 0.1U

Ref. No.	Part No.
C181	ECUV1C105ZF
C185, 186	ECUV1H331KC
C187	ECUV1H470JC
C188	ECUV1H331KC
C190	ECUV1H180JC
C201	ECEA0JK470
C202	ECUV1E104ZF
C203, 204	ECUV1H180JC
C205, 206	ECUV1E104ZF
C207	ECUV1H271KC
C208	ECUV1H221KC
C209, 210	ECUV1E104MB
C211	ECUV1H221KC
C212, 213	ECEA1CK220
C214, 215	ECUV1H101KC
C216, 217	ECUV1C105ZF
C218, 219	ECUV1H390KC
C220, 221	ECUV1H121KC
C222, 223	ECUV1C105ZF
C224	ECQV1H683JZ
C225, 226	ECUV1H332MB
C227	ECUV1E333MD
C228	ECUV1H181KC
C229	ECEA0JK221B
C230	ECEA0JK470
C231	ECEA1AU470
C232	ECEA1CK220
C233	ECUV1E104ZF
C234	ECEA1CK470
C235, 236	ECUV1E104ZF
C237	ECUV1C105ZF
C238	ECUV1E223MB
C239	ECUV1E683MB
C240	ECUV1E153MB
C241	ECUV1E104MB
C242-246	ECUV1E104ZF
C247, 248	ECUV1E333MD
C249	ECUV1E153MB
C250	ECUV1E104MB
C251-253	ECUV1E104ZF
C260	ECUV1E334ZF
C268	ECUV1C105ZF
C269	ECUV1E103KB
C270	ECEA0JK470
C271	ECUV1E104ZF
C272	ECUV1E223MB
C273	ECUV1H101KC
C274	ECUV1E103KB
C275	ECUV1C105ZF
C276	ECUV1H221KC
C280	ECUV1C334ZF
C301, 302	ECQM1H224JZ

Values & Remarks
1/10W 47K
1/10W 22
1/10W 47K
1/4W 100
1/4W 15K
1/4W 220
1/4W 10K
1/4W 27
1/10W 75
1/10W 47K
1/10W 330K
1/10W 75
1/10W 10
1/10W 22K
1/4W 220
1/10W 47K
1/10W 100K
1/10W 330
1/10W 100K
1/10W 100
1/10W 100K
1/4W 330
1/10W 100K
1/10W 47K
1/10W 3.3K
1/10W 100K
1/10W 3.3K
1/10W 330
1/10W 560
1/10W 330
1/10W 560
1/10W 330
1/10W 560
1/10W 1K
1/10W 220
1/10W 560
1/10W 75
1/10W 47
1/10W 560
1/10W 100K
1/4W 18K
1/10W 10K
1/10W 3.3K
1/10W 4.7K
1/10W 10K
1/10W 4.7K
1/10W 100
1/10W 10K
1/10W 4.7K

Ref. No.	Part No.	Values & Remarks
R431, 432	RRJ6GCAD273T	1/10W 27K
R433, 434	ERJ6GEYJ225V	1/10W 2.2M
R435, 436	ERJ6GEYJ220	1/10W 22
R437, 438	ERJ6GEYJ331V	1/10W 330
R439, 440	ERJ6GEYJ220	1/10W 22
R441, 442	RRJ6GCAD222T	1/10W 2.2K
R443-446	RRJ6GCAD272T	1/10W 2.7K
R447, 448	RRJ6GCAD222T	1/10W 2.2K
R449, 450	RRJ6GCAD562T	1/10W 5.6K
R451	ERJ6GEYJ331V	1/10W 330
R452	ERJ6GEYJ561V	1/10W 560
R471, 472	ERJ6GEYJ471V	1/10W 470
R473-478	ERJ6GEYJ473V	1/10W 47K
R501, 502	ERJ6GEYJ102V	1/10W 1K
R503, 504	RRJ6GCAD472T	1/10W 4.7K
R505, 506	RRJ6GCAD122T	1/10W 1.2K
R507, 508	ERJ6GEYJ105	1/10W 1M
R509, 510	RRJ6GCAD332T	1/10W 3.3K
R511, 512	RRJ6GCAD562T	1/10W 5.6K
R513-520	RRJ6GCAD822T	1/10W 8.2K
R521, 522	RRJ6GCAD183T	1/10W 18K
R523, 524	ERJ6GEYJ124V	1/10W 120K
R525-528	RRJ6GCAD822T	1/10W 8.2K
R529, 530	RRJ6GCAD183T	1/10W 18K
R531, 532	ERJ6GEYJ394V	1/10W 390K
R533, 534	RRJ6GCAD183T	1/10W 18K
R535, 536	ERJ6GEYJ394V	1/10W 390K
R537-540	RRJ6GCAD750T	1/10W 75
R541-544	ERJ6GEYJ331V	1/10W 330
R545-548	ERJ6GEYJ103V	1/10W 10K
R549, 550	ERJ6GEYJ473V	1/10W 47K
R561-564	ERJ6GEYJ472V	1/10W 4.7K
R571, 572	ERJ6GEYJ102V	1/10W 1K
R575, 576	ERDS2TJ102	1/4W 1K
R577, 578	ERDS2TJ103	1/4W 10K
R579, 580	ERDS2TJ123	1/4W 12K
R581, 582	ERDS2TJ104	1/4W 100K
R583, 584	ERDAS3G100T	1/4W 10
R585, 586	ERDAS3G330T	1/4W 33
R587, 588	ERDAS3G332T	1/4W 3.3K
R589, 590	ERDAS3G102T	1/4W 1K
R591, 592	ERDS2EJ121	1/4W 120
R593-596	ERDS2TJ222	1/4W 2.2K
R601, 602	ERDS2TJ472	1/4W 4.7K
R603	ERDS2TJ473	1/4W 47K
R604	ERDS2TJ472	1/4W 4.7K
R605	ERDS2TJ100	1/4W 10
R606, 607	ERDS2TJ102	1/4W 1K
R610, 611	ERDS2TJ471	1/4W 470
R612	ERDS2TJ102	1/4W 1K
R613-619	ERDS2TJ103	1/4W 10K
R620	ERDS2TJ471	1/4W 470

Ref. No.	Part No.	Values & Remarks
R621	ERDS2TJ105T	1/4W 1M
R622	ERDS2TJ102	1/4W 1K
R801	RRJ6GCAD750T	1/10W 75
R802	ERJ6GEYJ101V	1/10W 100
R803	ERJ6GEYJ103V	1/10W 10K
R804	ERJ6GEYJ473V	1/10W 47K
R805	ERJ6GEYJ392V	1/10W 3.9K
R806	ERJ6GEYJ103V	1/10W 10K
R807	ERJ6GEYJ392V	1/10W 3.9K
R808	ERJ6GEYJ103V	1/10W 10K
R809	ERJ6GEYJ332V	1/10W 3.3K
R810, 811	ERJ6GEYJ103V	1/10W 10K
R812	ERJ6GEYJ223V	1/10W 22K
R813	ERJ6GEYJ103V	1/10W 10K
R814	ERJ6GEYJ223V	1/10W 22K
R815	ERJ6GEYJ103V	1/10W 10K
R816	ERJ6GEYJ471V	1/10W 470
R817	ERJ6GEYJ105	1/10W 1M
R818	ERJ6GEYJ472V	1/10W 4.7K
R819-821	ERJ6GEYJ103V	1/10W 10K
R822	RRJ6GCAD183T	1/10W 18K
R823	RRJ6GCAD683T	1/10W 68K
R824	ERJ6GEYJ103V	1/10W 10K
R825	RRJ6GCAD153T	1/10W 15K
R826	ERJ6GEYJ102V	1/10W 1K
R827	RRJ6GCAD822T	1/10W 8.2K
R828	ERJ6GEYJ332V	1/10W 3.3K
R829	RRJ6GCAD822T	1/10W 8.2K
R830	ERJ6GEYJ103V	1/10W 10K
R831	ERJ6GEYJ393V	1/10W 39K
R832	ERJ6GEYJ102V	1/10W 1K
R833	ERJ6GEYJ105	1/10W 1M
R834	RRJ6GCAD750T	1/10W 75
R835, 836	ERJ6GEYJ102V	1/10W 1K
R837	RRJ6GCAD750T	1/10W 75
R838, 839	ERJ6GEYJ1R0V	1/10W 1.0
R840, 841	ERJ6GEYJ102V	1/10W 1K
R842	ERJ6GEYJ472V	1/10W 4.7K
R843, 844	ERJ6GEYJ103V	1/10W 10K
R845	ERJ6GEYJ334V	1/10W 330K
R846, 847	ERJ6GEYJ473V	1/10W 47K
R848, 849	ERJ6GEYJ472V	1/10W 4.7K
R850	ERJ6GEYJ683V	1/10W 68K
R851	ERJ6GEYJ473V	1/10W 47K
R852, 853	ERJ6GEYJ152V	1/10W 1.5K
R854	ERJ6GEYJ105	1/10W 1M
R855	ERJ6GEYJ472V	1/10W 4.7K
R856, 857	ERJ6GEYJ103V	1/10W 10K
R859	ERJ6GEYJ102V	1/10W 1K
R860	ERJ6GEYJ393V	1/10W 39K
R861	ERJ6GEYJ102V	1/10W 1K
R862	ERJ6GEYJ105	1/10W 1M

Ref. No.	Part No.	Values & Remarks
R880-882	ERJ6GEYJ471V	1/10W 470
R890	ERJ6GEYJ682V	1/10W 6.8K
R891	ERJ6GEYJ392V	1/10W 3.9K
R892	ERJ6GEYJ682V	1/10W 6.8K
R893	ERJ6GEYJ332V	1/10W 3.3K
R894	ERJ6GEYJ103V	1/10W 10K
R895	ERJ6GEYJ105	1/10W 1M
		CAPACITORS
C1	ECKWNS102MBM	400V 1000P ⚠
C11-18	ECKR1H103ZF5	50V 0.01U
C20, 21	ECKR1H103ZF5	50V 0.01U
C22, 23	ECEA1EPZ332E	25V 3300U ⚠
C24	ECES1EU682G	25V 6800U ⚠
C25	ECEA1CU472E	16V 4700U ⚠
C26	ECEA1HU221B	50V 220U ⚠
C27-30	ECEA1CU100	16V 10U
C31	ECEA1VU330	35V 33U
C32	ECKR1H103ZF5	50V 0.01U
C33	ECEA1EU470	25V 47U
C34	ECKR1H103ZF5	50V 0.01U
C101, 102	ECUV1H222KBN	50V 2200P
C103, 104	ECUV1H471KCN	50V 470P
C105	ECUV1H470JCN	50V 47P
C107	ECUV1H222KBN	50V 2200P
C110	ECEA0JK221B	6.3V 220U
C123	ECUV1C105ZFM	16V 1U
C124, 125	ECUV1H472KBN	50V 4700P
C126, 127	ECUV1H470JCN	50V 47P
C129, 130	ECEA0JKS220B	6.3V 22U
C131	ECUV1H222KBN	50V 2200P
C150	ECUV1H471KCN	50V 470P
C151	ECUV1H222KBN	50V 2200P
C152	ECUV1H102KBN	50V 1000P
C154	ECUV1H220JCN	50V 22P
C155, 156	ECUV1H102KBN	50V 1000P
C157	ECUV1C105ZFM	16V 1U
C159	ECUV1H220JCN	50V 22P
C161	ECUV1H562KBN	50V 5600P
C163	ECUV1H562KBN	50V 5600P
C166	ECUV1E153MBN	25V 0.015U
C167	ECUV1H102KBN	50V 1000P
C168	ECUV1H270JCN	50V 27P
C169	ECUV1H100JCN	50V 10P
C171, 172	ECUV1H680JCN	50V 68P
C173	ECUV1H471KCN	50V 470P
C174	ECUV1E104MBN	25V 0.1U
C175	ECUV1H472KBN	50V 4700P
C176	ECUV1E333MDN	25V 0.033U
C177, 178	ECUV1H101KCN	50V 100P
C179	ECUV1E104MBN	25V 0.1U

Ref. No.	Part No.	Values & Remarks
C181	ECUV1C105ZFM	16V 1U
C185, 186	ECUV1H331KCN	50V 330P
C187	ECUV1H470JCN	50V 47P
C188	ECUV1H331KCN	50V 330P
C190	ECUV1H180JCN	50V 18P
C201	ECEA0JK470	6.3V 47U
C202	ECUV1E104ZFN	25V 0.1U
C203, 204	ECUV1H180JCN	50V 18P
C205, 206	ECUV1E104ZFN	25V 0.1U
C207	ECUV1H271KCN	50V 270P
C208	ECUV1H221KCN	50V 220P
C209, 210	ECUV1E104MBN	25V 0.1U
C211	ECUV1H221KCN	50V 220P
C212, 213	ECEA1CK220	16V 22U
C214, 215	ECUV1H101KCN	50V 100P
C216, 217	ECUV1C105ZFM	16V 1U
C218, 219	ECUV1H390KCN	50V 39P
C220, 221	ECUV1H121KCN	50V 120P
C222, 223	ECUV1C105ZFM	16V 1U
C224	ECQV1H683JZ3	50V 0.068U
C225, 226	ECUV1H332MBN	50V 3300P
C227	ECUV1E333MDN	25V 0.033U
C228	ECUV1H181KCN	50V 180P
C229	ECEA0JK221B	6.3V 220U
C230	ECEA0JK470	6.3V 47U
C231	ECEA1AU470	10V 47U
C232	ECEA1CK220	16V 22U
C233	ECUV1E104ZFN	25V 0.1U
C234	ECEA1CK470	16V 47U
C235, 236	ECUV1E104ZFN	25V 0.1U
C237	ECUV1C105ZFM	16V 1U
C238	ECUV1E223MBN	25V 0.022U
C239	ECUV1E683MBN	25V 0.068U
C240	ECUV1E153MBN	25V 0.015U
C241	ECUV1E104MBN	25V 0.1U
C242-246	ECUV1E104ZFN	25V 0.1U
C247, 248	ECUV1E333MDN	25V 0.033U
C249	ECUV1E153MBN	25V 0.015U
C250	ECUV1E104MBN	25V 0.1U
C251-253	ECUV1E104ZFN	25V 0.1U
C260	ECUV1E334ZFM	25V 0.33U
C268	ECUV1C105ZFM	16V 1U
C269	ECUV1E103KBN	25V 0.01U
C270	ECEA0JK470	6.3V 47U
C271	ECUV1E104ZFN	25V 0.1U
C272	ECUV1E223MBN	25V 0.022U
C273	ECUV1H101KCN	50V 100P
C274	ECUV1E103KBN	25V 0.01U
C275	ECUV1C105ZFM	16V 1U
C276	ECUV1H221KCN	50V 220P
C280	ECUV1C334ZFN	16V 0.33U
C301, 302	ECQM1H224JZ	50V 0.22U

Ref. No.	Part No.	Values & Remarks
C303, 304	ECBT1H470J5	50V 47P
C305	ECBT1E103ZF	25V 0.01U
C306	ECBT1H104ZF5	50V 0.1U
C307, 308	ECQM1H224JZ	50V 0.22U
C309, 310	ECBT1H151KB5	50V 150P
C311, 312	ECUV1H103ZFN	50V 0.01U
C313	ECUV1H470KCN	50V 47P
C314	ECUV1E103KBN	25V 0.01U
C315	ECUV1E104ZFN	25V 0.1U
C316	ECUV1H470KCN	50V 47P
C317	ECUV1E104MBN	25V 0.1U
C318	ECUV1H103ZFN	50V 0.01U
C319	ECEA0JU330	6.3V 33U
C320	ECEA1HU4R7	50V 4.7U
C321, 322	ECUV1H103ZFN	50V 0.01U
C323	ECBT1E103ZF	25V 0.01U
C324	ECEA1CU330	16V 33U
C326	ECBT1H104ZF5	50V 0.1U
C330	ECEA0JU101B	6.3V 100U
C331	ECUV1H050CCN	50V 5P
C332	ECUV1H102KBN	50V 1000P
C333	ECUV1H150JCN	50V 15P
C334	ECUV1H103ZFN	50V 0.01U
C335	ECUV1E224ZFN	25V 0.22U
C336	ECUV1H103ZFN	50V 0.01U
C349, 350	ECBT1H102KB5	50V 1000P
C351, 352	ECUV1H103ZFN	50V 0.01U
C353, 354	ECUV1H102KBN	50V 1000P
C355	ECUV1E104ZFN	25V 0.1U
C356	ECBT1E103ZF	25V 0.01U
C357-364	ECUV1H103ZFN	50V 0.01U
C366-379	ECUV1H103ZFN	50V 0.01U
C380, 381	ECUV1H100CCN	50V 10P
C384	ECUV1H103ZFN	50V 0.01U
C385	ECEA0JU101B	6.3V 100U
C386	ECUV1H103ZFN	50V 0.01U
C388	ECUV1H103ZFN	50V 0.01U
C390	ECUV1H103ZFN	50V 0.01U
C391	ECEA0JU330	6.3V 33U
C392, 393	ECUV1H103ZFN	50V 0.01U
C396	ECUV1E104ZFN	25V 0.1U
C399	ECEA0JU221	6.3V 220U
C401-404	ECEA1CPZ470B	16V 47U
C405-412	ECUV1H220JCN	50V 22P
C417, 418	ECEA1CPZ470B	16V 47U
C419, 420	ECBT1E103ZF	25V 0.01U
C421, 422	ECEA1CPZ470B	16V 47U
C423, 424	ECUV1H220JCN	50V 22P
C425, 426	ECQB1H272JZ	50V 2700P
C427, 428	ECEA0JPZ221B	6.3V 220U
C429, 430	ECUV1E104ZFN	25V 0.1U
C431	ECEA1CU100	16V 10U

Ref. No.	Part No.	Values & Remarks
C432	ECUV1E104ZFN	25V 0.1U
C433	ECEA1CU220	16V 22U
C434	ECUV1E104ZFN	25V 0.1U
C435	ECEA1CPZ101B	16V 100U
C436	ECUV1E104ZFN	25V 0.1U
C438	ECUV1E104ZFN	25V 0.1U
C439	ECUV1H103ZFN	50V 0.01U
C441-448	ECEA0JPZ221B	6.3V 220U
C449, 450	ECEA1CPZ470B	16V 47U
C451, 452	ECEA1CPZ101B	16V 100U
C453, 454	ECEA1CU220	16V 22U
C455, 456	ECUV1H220JCN	50V 22P
C457-460	ECHR1H182JZ3	50V 1800P
C461-466	ECHR1H221JZ3	50V 220P
C471, 472	ECEA0JU101B	6.3V 100U
C473, 474	ECEA1CU471B	16V 470U
C475, 476	ECUV1H103ZFN	50V 0.01U
C477, 478	ECEA1CU471B	16V 470U
C479-488	ECUV1H103ZFN	50V 0.01U
C489	ECUV1H100CCN	50V 10P
C490-492	ECUV1E104ZFN	25V 0.1U
C498	ECUV1E104ZFN	25V 0.1U
C501, 502	ECUV1H220JCN	50V 22P
C505-508	ECUV1H150JCN	50V 15P
C513-516	ECEA1CPZ221B	16V 220U
C520	ECUV1H103ZFN	50V 0.01U
C531, 532	ECEA1CU471B	16V 470U
C533, 534	ECUV1H103ZFN	50V 0.01U
C545-548	ECHR1H681JZ3	50V 680P
C550-552	ECQV1H104JZ3	50V 0.1U
C553, 554	ECKT1H101KB	50V 100P
C555, 556	ECQV1H104JZ3	50V 0.1U
C557, 558	ECUV1H220JCN	50V 22P
C561, 562	ECEA1CU220	16V 22U
C563, 564	ECEA1CN100SB	16V 10U
C569	ECEA1VK100B	35V 10U
C571-574	ECEA1CPZ101B	16V 100U
C581, 582	ECUV1H220JCN	50V 22P
C583, 584	ECUV1H103ZFN	50V 0.01U
C602, 603	ECEA0JK470	6.3V 47U
C604, 605	ECBT1E103ZF	25V 0.01U
C652	ECBT1H102KB5	50V 1000P
C654	ECBT1H102KB5	50V 1000P
C655	ECEA1VK100B	35V 10U
C656	ECBT1H102KB5	50V 1000P
C657	ECEA0JK470	6.3V 47U
C658	ECBT1E103ZF	25V 0.01U
C660	ECBT1E103ZF	25V 0.01U
C694	ECBT1E103ZF	25V 0.01U
C751	ECKW1H103ZF5	50V 0.01U
C801	ECEA1CN330S	16V 33U
C802	ECUV1H050CCN	50V 5P

Ref. No.	Part No.	Values & Remarks
C803	ECUV1H100CCN	50V 10P
C804	ECUV1H050CCN	50V 5P
C805	ECEA1CN330S	16V 33U
C806	ECQM1H224JZ	50V 0.22U
C807	ECEA1CN330S	16V 33U
C808	ECQV1H105JZ3	50V 1U
C809	ECUV1H103ZFN	50V 0.01U
C810, 811	ECEA0JU101B	6.3V 100U
C812	ECUV1H103ZFN	50V 0.01U
C813	ECUV1E104ZFN	25V 0.1U
C814	ECUV1E473MBN	25V 0.047U
C815	ECUV1H820JCN	50V 82P
C816	ECUV1E104ZFN	25V 0.1U
C817	ECUV1H103ZFN	50V 0.01U
C818	ECUV1H471JCN	50V 470P
C819, 820	ECUV1E104ZFN	25V 0.1U

Ref. No.	Part No.	Values & Remarks
C821	ECUV1H221JCN	50V 220P
C822	ECUV1H681KBN	50V 680P
C823	ECUV1H101KCN	50V 100P
C824	ECUV1E103KBN	25V 0.01U
C825, 826	ECUV1H103ZFN	50V 0.01U
C827	ECUV1E104ZFN	25V 0.1U
C828	ECUV1E103KBN	25V 0.01U
C829	ECQV1H105JZ3	50V 1U
C830	ECUV1H820JCN	50V 82P
C831	ECUV1H680JCN	50V 68P
C832	ECEA0JU101B	6.3V 100U
C833	ECUV1H103ZFN	50V 0.01U
C835	ECUV1E104MBN	25V 0.1U
C836	ECUV1H822KBN	50V 8200P
C837	ECUV1H560KCN	50V 56P
C839	ECUV1H221JCN	50V 220P

Ref. No.	Part No.	Values & Remarks
C840	ECUV1H681KBN	50V 680P
C841	ECUV1H101KCN	50V 100P
C842, 843	ECUV1E104ZFN	25V 0.1U
C844	ECUV1H221JCN	50V 220P
C847	ECEA0JU101B	6.3V 100U
C848	ECEA0JU221	6.3V 220U
C850	ECUV1H050CCN	50V 5P
C851	ECUV1H100CCN	50V 10P
C852	ECUV1H050CCN	50V 5P
C881, 882	ECEA0JU101B	6.3V 100U
C883, 884	ECEA0JU221	6.3V 220U
C885, 886	ECUV1H100CCN	50V 10P
C887	ECUV1E104ZFN	25V 0.1U
C898	ECUV1H331KCN	50V 330P

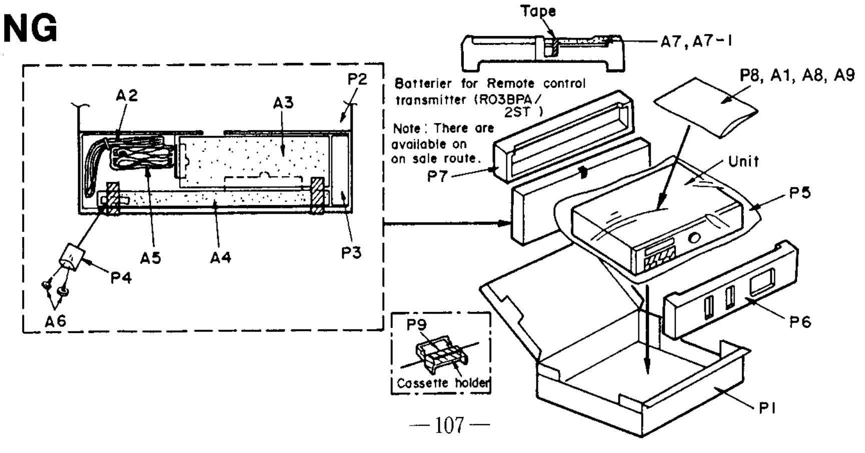
REPLACEMENT PARTS LIST

Notes: *Important safety notice:
Components identified by △ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*Remote Control Ass'y: Supply period for three years from termination of production.
*The "(SF)" mark denotes the standard part.

Ref. No.	Part No.	Part Name & Description	Remarks
		PACKING MATERIAL	
P1	RPG2224	PACKING CASE	
P2	RPN0391-1	ACCESSORIES BOX	
P3	RPN0392	PAD(ACCESSORIES)	
P4	XZB09X10C03	PROTECTION BAG(SCREW)	
P5	RPF0017	PROTECTION BAG(UNIT)	
P6	RPN0221-1	PAD(FRONT)	
P7	RPN0222-1	PAD(BACK)	
P8	XZB25X34C03Y	PROTECTION BAG(F.B.)	
P9	RPH0065-1	SOFT SHEET	
		ACCESSORIES	

Ref. No.	Part No.	Part Name & Description	Remarks
A1	RFKSV4100EBH	INSTRUCTION MANUAL ASS'Y	
A2	RJA0045-K	AC POWER SUPPLY CORD	(EB)△
A2	RJA0003-K	AC POWER SUPPLY CORD	(EG)△(SF)
A3	RYQ0059-1	RACK EARS	(EB)
A3	RYQ0059-2	RACK EARS	(EG)
A4	RYQ0060-1	RACK PANELS	
A5	SJPD19-1E	COAXIAL CABLE	
A6	XYN3+F10FZ	SCREW	
A7	RAK-SV012WH	REMOTE CONTROL TRANSMITTER	
A7-1	RKK0020-K	BATTERY COVER	FOR R/C TRANSMITTER
A8	RQA0013	WARRANTY CARD	
A9	RQCB0169	SERVICENTER LIST	

PACKAGING



Batterier for Remote control transmitter (RO3BPA/2ST)

Note: There are available on on sale route.

Printed in Japan
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